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The Effect of a Targeted Retention Program at a Technical College

By

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of the requirements for the degree of

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The Effect of a Targeted Retention Program at a Technical College

Dissertation Abstract – Idaho State University (2020)

College student retention literature has traditionally focused on the residential university setting. Likewise, research on student service programs and intervention designed to increase persistence and completion have also focused on the four-year residential university. Limited research has been focused on students who are pursuing career technical education (CTE) at two-year colleges. This study examined the efficacy of a student retention program, Connect for Success, developed for CTE students at a technical college. Archival research was conducted to determine if participation in the Connect for Success program had a positive effect on student completion. Data were analyzed using logistic regression, including six independent variables (participation in the Connect for Success program, age, sex, first-generation student status, Pell eligibility, and student dependent status) and one dependent variable (degree completion). Results suggest that participation in the Connect for Success program, age, and eligibility for Pell grant funding are associated with increased odds of degree completion for students. Multifaceted retention programs could be an effective way for institutions of higher education to improve retention rates of CTE students.

Key Words: Career Technical Education, Retention, and Completion

Chapter I: Introduction

Completing a college degree has long been considered one of the surest paths to upward mobility and financial security. Despite recent questions about the value of a college degree that have appeared in the media, there is evidence to support the value of a college degree (Emmons et al., 2019). On the individual level, college degrees can lead to increased earning power and job stability. Information compiled by the Bureau of Labor Statistics (BLS, 2017) shows that earnings rise with educational attainment. The median earnings of a person with a high school diploma is \$692 per week, while the median earning for an individual with an associate's degree or bachelor's degree is \$819 and \$1,156 per week respectively. A person with a bachelor's degree will earn one million dollars more in their lifetime than a person with a high school diploma (Tinto, 2012), suggesting that increased educational attainment is indeed associated with greater financial security.

While much attention is focused on the bachelor's degrees, it is not the only route to economic opportunity (Carnevale et al., 2020). In today's workforce 35% of workers hold a bachelor's degree or higher and 34 percent have a high school education or less. The remaining third of the workforce followed the middle-skills pathway to employment and have either completed an associates or certificate, or have some college credits (Carnevale et al., 2020). Currently 50% of undergraduates are pursuing an associate's degree or a certificate, this makes up the majority of all undergraduates. Colleges in the United States award certificates and associate degrees at approximately the same rate as bachelor's degrees. Given that good jobs for

workers with a high school diploma have decreased, the middle skills and bachelor's degree paths are now more likely to lead to economic prosperity (Carnevale et al., 2020).

In addition to increased earning power, individuals with higher educational attainment have lower unemployment rates. According to the BLS (2017), persons with a high school diploma had a median unemployment rate of 5.2%. The unemployment rate fell for those with an associate's degree to 3.6%. This rate came down even further for those with a bachelor's degree to 2.7%. This indicates that individuals with higher educational attainment enjoy greater job security.

In addition to the individual benefits of college degree completion, states and local communities also gain economic benefits from having an educated, skilled workforce. The final report of the Idaho's Workforce Development Taskforce (IWDT, 2017) stated that Idaho can anticipate an increase of 49,000 jobs by 2024. On the surface, this would appear to be good news. However, 67% of these new jobs will require some form of post-secondary training. Furthermore, thousands of current jobs in Idaho are already chronically unfilled due to a shortage of skilled workers (IWDT, 2017). Idaho faces a critical shortage of skilled workers because of a skills gap between available workers and the skills needed for the work. IWDT recommended that industry and education work together to close this gap and provide the skilled workers necessary for Idaho's economy to prosper (2017).

Given the importance of post-secondary degree attainment, it is not surprising that policy makers have made retention and college completion a recent focus. In an effort to influence college and university behaviors towards this focus on retention, some states have turned to performance-based funding (Nisar, 2015). Performance-based funding efforts tie state funding

for institutions of higher education to performance indicators such as retention and completion rather than to enrollments, as has traditionally been done. Despite this focus on performance-based funding, our public institutions of higher education are not performing as well as we would like them to. According to statistics published by American College Testing (ACT), a non-profit organization dedicated to college and career readiness, nationwide retention rates for public institutions remain low (ACT, 2015). The percentage of students who return for their sophomore year is 54.7% for two-year schools and 64.2% for those pursuing a bachelor's degree.

Completion rates are similarly low: Among two-year schools, only 21.9% of students graduate in three years or less. The completion rate among four-year institutions is not much better, as 36.4% of students pursuing a bachelor's degree at a public school will graduate in five years or less. These numbers for retention and completion rates hold particular importance given that public post-secondary institutions make up a majority of student enrollments. An estimated 73% of all post-secondary students are enrolled in public two-year and four-year institutions (National Center for Educational Statistics, 2015). Based on these low completion rates, it is clear that public institutions of higher education need to make drastic improvement in retention and completion in order to meet the future workforce needs of our economy.

For much of the 20th Century, the focus of higher education was on providing access to a broader range of our population. This focus on access was seen as bringing opportunity to many who would not otherwise have the chance to seek higher education. Despite the gains in access, a significant gap in completion between high and low-income students still remains (Tinto, 2012). Access without the support necessary to reach completion does not equal opportunity. In order to

fulfill the promise of opportunity that extended access to education presents, the focus of institutions of higher education must shift from not only access but to completion.

Increasing Completion Rates

There are steps that institutions of higher education can take to increase student retention and completion rates. In 2010, the American Association of Community Colleges (AACC) joined with five other national organizations to determine what could be done to promote what has become known as the Completion Agenda (Boggs & McPhail, 2016). The AACC convened two focus groups to identify ways in which completion could be encouraged and potential barriers that inhibited degree completion could be mitigated. In a subsequent report, it was concluded that one of the ways to advance the completion agenda was to be more proactive in approaching student success (McPhail, 2011). One of the suggested ways to be more proactive was to enhance student services. The proposed ways to improve student services included providing mandatory orientations, implementing a student success or first-year experience course, connecting students together through a cohort model, enhanced advising, and using early alert and intervention systems (Center for Community College Student Engagement, 2012; McPhail, 2011). These interventions could be introduced individually or as part of a suite of interventions offered together as a multifaceted support program.

Multifaceted student support programs have shown promising results for increasing retention and completion rates. One of the most widely studied multifaceted retention programs was CUNY's Accelerated Study in Associate Programs (ASAP) (Scrivener et al., 2015; Weiss, et al., 2019). Students participating in the CUNY ASAP program received comprehensive support for up to three years to overcome potential barriers to completion. Student supports included

advising from a program-dedicated advisor with a small caseload, tutoring services, career information provided through staff dedicated to ASAP students.

Students were enrolled in blocked or linked courses with reserved seats for ASAP students to create a cohort structure. Students were allowed to register early to get the courses they needed for on time graduation. A student success seminar was required for students during their first few semesters. If students had placed into any developmental coursework in math and English that they needed to get up to college level, they were encouraged to complete these courses early.

Students were also required to enroll in coursework full-time. Financial support were offered to students, including tuition waivers that covered the gap in financial aid and college tuition and fees, free textbooks, and Metro Cards for use on public transportation systems. This program, which included all of these supports, was found to be increase student success, nearly doubling the three-year graduation rate of program participants over the control group. ASAP's graduation rate was 40% as compared to the control group graduation rate of 22% (Scrivener et al., 2015). These impressive results provide hope that there are meaningful steps that colleges and universities can employ to increase completion rates and provide a better path to opportunity for their students.

Indeed, other universities have followed suit and implemented similar programs to increase student success and graduation rates. The ASAP program at CUNY was replicated at Ohio State, including support similar to the original program and obtained similar results. The Ohio ASAP program graduation rate was 35% as compared to 19% in the control group (Miller et. al, 2020; Sommo et al., 2018). Similarly, Washington State developed a short-term program

to support low-skill workers pursuing post-secondary training, known as the I-BEST Program (Glosser et al., 2018). The I-BEST programs were taught by an occupational instructor and a basic-skills instructor, and I-BEST participants received a dedicated advisor to offer help on career guidance and navigating college procedures, in addition to financial support for tuition and other materials that could not be covered by other sources. The I-BEST graduation rate was 44.2% as compared to 12% in the control group. Together, these three studies suggest that the implementation of multifaceted student support programs can have a major impact on student degree completion.

Problem Statement

While the literature on retention is quite extensive, and many studies have found promise implementing multifaceted student support programs to increase retention and completion rates, most of the literature has focused on retaining students at a four-year residential college (Braxton et al., 2004; Braxton et al., 2014; Tinto, 1993). Little of the retention research has expanded into the field of commuter schools and two-year schools. Even less attention has been paid to retention within career and technical education (CTE) programs. To address the skills-gap problem and to aid students in attaining a livable wage, public colleges and universities need to find a way to improve retention and completion. Empirical studies are needed to understand and support the retention rates of students; specifically, those enrolled in CTE programs.

Purpose Statement and Research Questions

Therefore, the purpose of this study was to fill in some of the gaps of our understanding of the retention of CTE students. With much of the existing literature focused on four-year residential universities, this study fills a gap in the literature by focusing on the effect of a

retention effort implemented with CTE students. Specifically, this study used logistic regression to examine the relationship between participation in a targeted-retention program and the retention and completion of CTE students at a stand-alone technical college. This research study was guided by two questions:

1. Does participation in a retention program affect student retention and completion?
2. What other factors are associated with retention and completion among CTE students?

Significance

This study fills specific gaps in the body of research concerning student-retention programs and their impact on students in higher education. This study examines the effect of a multifaceted student retention program on CTE students in a rural setting.

Previous research on multifaceted student retention programs has found them to be largely successful (Miller et al., 2020; Scrivener et al., 2015; Sommo et al., 2018; Weiss et al., 2019). However, these studies have been conducted at larger urban community colleges.

Students who participated in the ASAP programs had a variety of educational goals. Many had the goal of transferring to pursue a higher degree. In fact, of the CUNY ASAP students who were surveyed, 87.6% planned to pursue a bachelor's degree or higher (Scrivener et al., 2015). While the focus of the I-BEST program was on CTE, it was on short-term workforce credentialing programs that typically lasted only one or two quarters. This study examined longer term CTE programs leading to a 2 year certificate or associates degree.

The current study was conducted in a rural setting and focused on students pursuing slightly longer-term credentials in the form of a two-year certificate and associate's degree within CTE fields. The 594 public rural community colleges make up more than 64% of all community

colleges (Buckwalter et. al, 2019). Moreover, rural community colleges serve 3.4 million students. Increasing retention and completion rates for the CTE students attending these schools would have a significant impact on increasing economic opportunities for these students.

Delimitations

The delimitations of this study include set parameters for the location and sample criterion. This study was confined to students who attended Eastern Idaho Technical College (EITC) during the duration of the Connect for Success (CFS) program, which ran annually each year beginning in the spring 2014 semester and ending in the spring 2017 semester. EITC is a rural technical college offering CTE programs exclusively (i.e. no associate's degree programs are available). CFS participants were defined as those students who applied and were accepted into the retention program.

The measure used for retention in this study was a completed degree or certificate. It is assumed that when a student completes a degree or certificate, they are prepared to enter the workforce. Consequently, this is a better measure than fall-to-fall retention rates of whether the institution is meeting the workforce needs of the local community.

Limitations

When considering conclusions that can be derived from the results of the study, it is important to consider possible limitations. The biggest limitation to this study is selection bias. Participants self-selected into CFS program and were not selected randomly into control and treatment groups. This leads to a situation where it is not possible to determine whether the difference in outcomes is due to participation in the CFS program or the fundamental differences inherent in the participants that lead them to seek acceptance into the program in the first place.

A second limitation of this study is that of omitted variables. It is simply not possible to include all the variables that could have affected student completion. The possible variables are extensive. Even within the framework of the eight common factors identified by Burrus et al. (2013), this study was only able to collect data that would fall within three of these factors: student demographic characteristics, student finances, and environmental pull. The data set did not include information about student commitment, academic preparation and success factors, psychosocial and study-skill factors, or integration and fit. It may well be that variance in completion was better explained by factors that were not included in this study's statistical model.

Additionally, although the quantitative analysis indicated that several of the independent variables were associated with increased rates of completions, it does not explain why the variable has an effect. A different research design would need to be crafted to identify why a particular variable positively contributed to an increased likelihood of completion.

Another concern with this study is its generalizability. The sample population was very homogeneous, with 78.4% self-identified as White. With such a homogenous population, the sample was not diverse enough to look at race and ethnic backgrounds as variables. Given this limitation, the interventions used in the CFS program may not be widely generalizable to more diverse student populations. Additionally, the setting for the study was a small rural technical college with CTE students, which calls into question the generalizability of the results of this study to institutions of various sizes and character.

A final concern would be the integrity of the data used. Data were collected from the host institution's student database. Information in the institutional database was populated by the

Institution Student Information Record (ISIR) system that is generated when a student applies for federal financial aid. Additionally, self-reported student information is entered into the data base from students' application for admission. This limited the information that was able to be gathered and the variables that were considered. It can also prove problematic in that some of the data was used as a proxy indicator. Pell eligibility was used as a proxy of socio-economic status, and dependents status was used as a proxy for family obligation. There may have been situations when the data was an ineffective proxy for the variable in question. Perhaps the most challenging example of this is the conflation of sex and gender. On the application for admissions, students were asked their gender, when the information that was sought by the admissions office was the student's biological sex. Trans-gendered or non-binary students would have answered using a broader conception of gender that was not limited to just biological sex, had there been a place on the application to do so. For this study, gender was used as a proxy for biological sex, and biological sex is the student background variable that was analyzed. This method could also lead to incorrect data. If a student reported incorrect data, it would have been pulled into the overall data set without any way of verifying it.

When the data were checked for completeness, the researcher noticed that there were missing data when it came to whether a student had dependents or not. If this variable was incomplete, the participant was removed from the data set. Since this information was pulled from financial aid information, it left only participants who had completed a financial aid application. This could have made the sample unrepresentative of the overall population.

Organization of the Dissertation

Chapter I of this dissertation is an introduction to college student retention as a problem faced by public institutions of higher education. In Chapter II, the literature review focuses on the conceptual framework of retention and explores some of the existing practices, particularly the practices employed by the target retention program that is the subject of this study. Chapter III includes the methodology for the study, including the study design and selection process for the CFS program, data collected and preparation, and data analysis. Chapter IV discusses the results of the data analysis. Chapter V provides a conclusion to the study, potential areas for future research, and potential implications for policy and practice.

Chapter II: Literature Review

Colleges and universities struggle to retain students at the rate necessary to provide the skilled workforce that our economy requires (Boggs & McPhail, 2016). Multifaceted retention programs have shown promising results (Miller et al., 2020; Scrivener et al., 2015; Sommo et al., 2018; Weiss et al., 2019). A comprehensive review of related research revealed gaps in the study of retention efforts specific to Career and Technical Education (CTE). Further, study of retention programs for CTE students would benefit students and institutions in their completion and retention efforts. This study exams the effect of a multifaceted retention program on CTE students.

This review of literature provides background on the issue of student retention and completion. First, it will provide an introduction the theoretical background of retention. Second, it will move into an identification of student background variables that can have an effect on retention. Third, professional judgment will be examined and how it can be applied to turn theory into practice. Fourth it will examine the types of student retention interventions. Finally it will turn to how it can all apply to CTE students.

Theoretical Frameworks

Student attrition has been an accepted part of the higher education experience. Literature as far back as the early 1900s reference students leaving college and offered suggestions on how to address the issue (Brown, 1907). However, it was not until much later that a systematic study of the issue of attrition was applied to develop theories on how students could be retained by institutions. This represented an important shift of perspective from student attrition as a natural unavoidable part of the educational process to student retention, which viewed a student leaving

college as a discernable and preventable issue. Perhaps the most important of these theories on retention is Vincent Tinto's integration theory (1993), which focused on the importance of integrating into campus culture.

Vincent Tinto's Integration Theory

Vincent Tinto's *Leaving College* (1993) is considered a seminal work on student retention in higher education. This work forms the basis of subsequent theories of student retention and is essential to understanding the field today. In Tinto's integration theory (1993), a student leaving college was viewed as an issue of that student failing to integrate into the college either socially or academically. Tinto's model of student retention took a systemic look at three different factors; the pre-entry attributes of the student, the goals and commitments of the student, and the student's institutional experience. This model of student retention saw institutional activities as nested within a larger external community, acknowledging that the student's experience did not start and stop at the campus boundaries.

According to Tinto's theory, each student brought with them to college a set of attributes (1993). These attributes included the students' skills and abilities, prior school experiences, and family background. Together, a student's various attributes constituted a toolbox that the students brought with them to college and to the task of integrating and finding success both academically and socially in the college environment. A student's background attributes can also influence a student's expectations about college and about social norms in the college environment.

In addition to the attributes they bring to college, students also come to the college with an initial set of goals and commitments (Tinto, 1993). Students' goals refer to the individual

educational or career goals that students have for attending college. Some students may start college with very clear goals in mind. For example, they may aspire to become a lawyer, a doctor, or a similar profession. Others may not have very clear goals when they begin college; they are starting college because of family or societal pressures.

Just like goals, a student's commitment can vary. In integration theory commitment refers to a student's commitment to their chosen goal and to the educational institution that they are attending. Some students may not be committed to their chosen academic goal. These students may not have a clear understanding of the career they have chosen or may not have realistic expectations of their academic pathway. Other students may be very committed to their specific academic goal, but the level of commitment to the educational institution they are attending may not be as high. These students may not be retained but will transfer to other institutions to pursue their goals. Students without a clear goal or with lower commitment to meeting that goal are more likely to leave college (Tinto, 1993).

Social and Academic Integration. The college student's experience with their institution of enrollment occurs in two spheres: the academic sphere and the social sphere (Tinto, 1993). The academic sphere includes the intellectual life of the student, such as coursework and the academic experiences that the student will encounter at the college. The social sphere includes interpersonal interactions that the student has with peers. Both spheres have a formal and informal component to interpersonal interactions. The formal occurs within the organizational structure of the college. Coursework and the subsequent grading would be an example of a formal academic experience; whereas a college organized student dance would be an example of a formal social experience. Informal experiences occur outside of the structure of

the college. A discussion with a professor outside of class time or students socializing with friends they have made from the dormitory would be examples of this.

Students must find a way to integrate into the academic and social life of a college, as failure to do so can lead to incongruence or isolation (Tinto, 1993). Incongruence occurs when a student finds their experience to be different than what they had expected or hoped to have, while isolation occurs when a student is unable to make meaningful connections in the academic or social spheres of the college experience. Either instance can lead to the student deciding to leave the college.

The decision to stay at college is an iterative process. A student's experience during college affects both their initial goals and commitment (Tinto, 1993). Students who have successfully integrated into college will have an increased commitment to their educational goals and to pursue those goals at that particular institution, while students who experience incongruence falter in their commitment to their initial goal or institution. Students in the latter situation are led to the conclusion that a different goal or institution is more congruent with their anticipated or desired experiences. Students who experience isolation abandon the pursuit of education altogether and return to environments where they can feel a sense of connection.

Tinto's (1993) integration theory is largely based on a view of the traditional conception of college and college students. Traditional students are typically in their late teens and are going to college directly after completing high school. College is a residential experience for them, with students living on campus with little obligation outside of the classroom. Despite its direct application with traditional students, Tinto's theory does not hold up as well when applied to non-traditional students. Non-traditional students have little need for social integration on campus, as

they are often commuter students, spend very little time on campus outside of class, and have increased obligations outside of the classroom. While Tinto's theory has its limitations regarding non-traditional students and technical colleges, his work represents one of the first attempts to systematically understand why students leave college, which is essential to understanding later works on retention that build and expand upon his work.

Post-traditional Retention Theory

Tinto's (1993) integration theory of retention laid the conceptual framework for nearly all subsequent college student retention theories. One of the critiques to Tinto's theory was that it focused on the experience of traditional four-year residential college students. In response to this critique, Bean and Metzner (1985) offered a view that contributed to our understanding of the retention of non-traditional commuter students.

Bean and Metzner's (1985) view of non-traditional students is most strongly characterized by students' living arrangements off campus. These students commute to school and experience less of the socializing interactions than their on-campus peers. Furthermore, these students typically have increased external demands on their time; they are often required to focus a good deal of their attention on family and work obligations in addition to their schoolwork. Consequently, many non-traditional student interactions with the school environment may be limited solely to their time in class.

Bean and Metzner state that a non-traditional student's decision to stay in college is influenced by four variables (1985). The first of these variables is academic performance. Students who are performing poorly academically tend to drop out at higher rates than those who are performing well. The second variable is psychological outcomes. A student's commitment to

their goal, combined with their sense that the degree they are seeking is useful and their satisfaction with their experience, are all psychological outcomes that can influence retention. The third variable is background characteristics. Similar to the student attributes that Tinto (1993) recognized in his theory, Bean and Metzner found that each student comes to college with their own set of goals, preparation, and personal background. This background can have a profound effect on the student's ability to persist. Finally, environmental variables can affect retention. A student who is working outside of campus or participating in child rearing has environmental impacts that can affect that student's persistence.

In contrast to the importance that Tinto (1993) placed on integration into the college environment, Bean and Metzner's (1985) theory hinges on the pressure that non-traditional students felt from the external environment. They hypothesized that external environmental pressures were likely the most important variable in determining whether a non-traditional student would persist to complete their educational goals.

Bean and Metzner's (1985) focus on the experience of non-traditional students is a major contribution to retention theory, particularly as non-traditional students have become the new normal. Only 15% of undergraduate students can be considered traditional, with the term traditional referring to students who attend college directly after high school, attend full-time, and are financially dependent on their parents (Soares, 2013). Most undergraduates come back to college after some time away, attend part time, must work while attending school for financial reasons, or experience a combination of the three. The term non-traditional has become a misnomer, with the implication that non-traditional students are an aberration when they are in fact the new normal. The term post-traditional is more accurate and is the term this study will use

from here forward. Post-traditional is defined as students who fit in one or more of the following categories; are not of traditional age, are not attending full-time, are financially independent. EITC, the study institution, like many institutions across the country, has many post-traditional students attending its campus and consequently, Bean and Metzger's (1985) theory has great practical import.

Revisions to Tinto's Integration Theory

Some have contended that Tinto's (1993) integration theory has enjoyed paradigmatic status in the area of student retention. Using Tinto's theory as a foundation, Braxton et al. (2004) developed thirteen testable propositions:

1. Student entry characteristics affect the level of initial commitment to the institution.
2. Student entry characteristics affect the level of initial commitment to the goal of graduating from college.
3. Student entry characteristics directly affect the student's likelihood of persistence in college.
4. Initial commitment to the goal of graduation from college affects the level of academic integration.
5. Initial commitment to the goal of graduation from college affects the level of social integration.
6. Initial commitment to the institution affects the level of social integration.
7. Initial commitment to the institution affects the level of academic integration.
8. The greater the degree of academic integration, the greater the level of subsequent commitment to the goal of graduating from college.

9. The greater the degree of social integration, the greater the level of subsequent commitment to the institution.
10. The initial level of institutional commitment affects the subsequent level of institutional commitment.
11. The initial level of commitment to the goal of graduation from college affects the subsequent level of commitment to the goal of college graduation.
12. The greater the level of subsequent commitment to the goal of graduating from college, the greater the likelihood of student persistence in college.
13. The greater the level of subsequent commitment to the institution, the greater the likelihood of student persistence in college. (pp. 9-10)

The validity of the explanatory power of Tinto's (1993) integration theory hinged on finding strong empirical backing for propositions 8 and 9, given that social and academic integration are key to retaining students in this theory. Empirical backing would also be important for propositions 3, 12, and 13 since these concepts also play an important, albeit secondary, role in retention (Braxton et al., 2004). An empirical assessment was conducted to establish the level of support for each of these propositions at a variety of institutions. They found that in the aggregate, when all types of institutions were included, there was empirical support for propositions 1, 9, 10, 11, and 13 (Braxton et al., 2004).

The results of Braxton et al.'s (2004) study were further broken down by institution type in order to explore the efficacy of Tinto's (1993) integration theory on a variety of different institutions. Residential universities showed empirical support for propositions 5, 9, 10, 11, and 13. Commuter campuses showed empirical support for only two propositions, propositions 1 and

10. Two-year colleges had only one proposition that showed empirical support, proposition 3. However, in two-year colleges the remaining twelve propositions received indeterminate support and would thus still be open to empirical treatment (Braxton et al., 2004).

Given these results, a revision to Tinto's (1993) integration theory was proposed regarding residential universities and a new theory of student retention in commuter universities (Braxton et al., 2004). The revised theory started with the four propositions that were grounded in Tinto's theory, strongly empirically supported, and logically connected: propositions 1, 9, 10, and 13. This new theory then incorporated six factors that influenced social integration in college that had emerged from their study. These six factors include:

1. *Commitment of the institution to student welfare* – The institution values the growth and development of its students.
2. *Communal potential* – The student believes that a subgroup exists within the college community in which they can find membership.
3. *Institutional integrity* – The institution is true to its espoused mission and goals.
4. *Proactive social adjustment* – The student proactively adjusts to the pressures of social interaction in a college.
5. *Psychosocial engagement* – The student invests psychological energy in social interactions in the college community.
6. *Ability to pay* – Financial concerns and barriers. (Braxton et al., 2004, p. 22)

This revised integration theory can be stated as follows: students come to the university with various characteristics that influence their initial level of commitment to that university. In attending the university, students have many opportunities for social interaction and an

opportunity to integrate into the social fabric of the college. This integration is helped or hindered by the six factors mentioned above. A student who is successful in integrating into the social community will increase their commitment to the institution and subsequently increase the likelihood that they will persist to graduation. The basic elements of this theory include student entry characteristics, the external environment, the campus environment, and academic communities (Braxton et al., 2004). This new theory would improve our understanding of retention for students at commuter universities.

Much like residential students, commuter students arrive at the university with background characteristics that influence their initial commitment to the university (Braxton et al., 2004). However, commuter students are much more sensitive to the external environment when making decisions about leaving college. Commuter students frequently have obligations outside of the university including work and family. Departure from college can occur when college responsibilities come into conflict with these obligations. Alternatively, the external environment can play a positive role in student retention. If a student is receiving significant support from family and friends outside of the college community, and these are positive relationships that encourage students to continue attending college, students may be more likely to stay in college.

Given these outside obligations, many commuter students spend little time on campus. When they are on campus, the students primarily spend their time attending classes. Consequently, commuter students often do not have the time or interest to become socially integrated into the campus community. Therefore, it is important that organizations take on several characteristics to shape the campus environment to aid these students. These

characteristics are a commitment to the welfare of its students and institutional integrity (Braxton et al., 2004).

The final aspect to the revised integration theory (Braxton et al., 2004) is academic community. For many commuter students, the only time they spend on campus is to attend classes. Given this fact, it is important that their classroom experience is engaging and leads to their academic integration into the university and a further commitment to their educational goals and the institution. Instruction for these students should include engaging and collaborative instructional methods.

This revised theory does well in keeping the strengths of Tinto's (1993) original theory and adapting it to the circumstances of commuter students. Given these students' lack of interest in social integration, this theory incorporates other characteristics that will support them to completion. However, this theory does not adequately address student retention across two-year colleges, which remains open to speculation.

Further Revision to Tinto's Integration Theory

Following up on their previous work, Braxton et al. (2014) sought to provide empirical support for the revisions they had made to Tinto's (1993) theory for both residential and commuter university students. The researchers began their study by testing their revisions on residential universities. To test the theory of persistence at residential universities, a series of eight propositions was proposed, based on the foundation that the greater the student's belief that they have the ability to pay for the cost of attending the chosen college or university, the greater the student's degree of social integration.

1. The more a student perceives the institution is committed to the welfare of its students, the greater the student's level of social integration.
2. The more the student perceives the potential for community on campus, the greater the student's level of social integration.
3. The more a student perceives that the institution exhibits institutional integrity, the greater the student's level of social integration.
4. The greater the student's use of proactive adjustment strategies, the greater the student's level of social integration.
5. The greater the level of psychological energy that a student invests in various social interactions at their college or university, the greater the student's degree of social integration.
6. The greater the student's degree of social integration, the greater their level of subsequent commitment to the college or university.
7. The greater the level of subsequent commitment to the institution, the more likely the student persists in college. (Braxton et al., 2014, p. 136)

The results of testing these propositions indicated that an institution's commitment to the welfare of its students, its institutional integrity, and the level of psychological energy that a student invested in their college or university, positively influenced social integration. Interestingly, the ability to pay, communal potential, and proactive social adjustment did not influence subsequent social integration (Braxton et al., 2014).

Furthermore, the results of this study showed that increased social integration positively influenced subsequent institutional commitment, with institutional commitment then led to

increased student persistence. Thus, institutional commitment to student welfare, institutional integrity, and psychological engagement all lead to increased student persistence. With this in mind, Braxton et al. (2014) began testing their revisions to Tinto's (1993) theory with commuter students. To test this theory, Braxton et al. (2014) devised a series of 11 propositions:

1. As parental educational level increased, the likelihood of student persistence in a commuter or university decreased.
2. The higher the student's level of motivation to graduate from college, the greater their likelihood of persisting in a commuter college or university.
3. The lower the costs of college attendance incurred by the student, the greater their likelihood of persisting in a commuter college or university.
4. The greater the support the student received from significant others to attend college, the greater their likelihood of persistence in a commuter college or university.
5. The greater the student's need for social affiliation, the lower their likelihood of persistence in a commuter college or university.
6. The more a student perceived that their college or university is committed to the welfare of its students, the greater the student's degree of academic and intellectual development.
7. The more a student perceived that their college or university exhibited institutional integrity, the greater the student's degree of academic and intellectual development.
8. The more a student perceived that their college or university was committed to the welfare of its students, the greater the student's degree of subsequent commitment to their college or university.

9. The more a student perceived that their college or university exhibited institutional integrity, the greater the student's degree of subsequent commitment to their college or university.
10. The greater the degree of academic and intellectual development perceived by the student, the greater the student's degree of subsequent commitment to their college or university.
11. The greater the student's degree of subsequent commitment to their college or university, the greater the likelihood of their persistence in a commuter college or university. (p. 148-149)

The results of testing these propositions indicated that a student's perception of the college, or university's, commitment to student welfare and institutional integrity both had a positive influence on the students' academic and intellectual development. Commitment to student welfare had a stronger influence on student development than institutional integrity did. In sum, if a student believed that the institution had the student's best interest at heart and followed through on their promises, then that student tended to develop academically and intellectually (Braxton et al., 2014).

Similarly, institutional integrity and greater perceived academic and intellectual development positively influenced a student's subsequent commitment to the institution. This is to say that if a student believed that a college was following through on their promises, and students feel that they were learning something by attending the college, students had a greater commitment to keep attending. However, institutional commitment to student welfare was not found to influence a student's subsequent commitment to the institution; even if a student felt

that the institution had their best interests at heart, it was not enough for them to want to keep attending that institution (Braxton et al., 2014).

As anticipated by the researchers, increased subsequent commitment to the institution resulted in a greater likelihood that the student would persist. Thus, institutional integrity and greater academic and intellectual development all led to increased persistence at commuter colleges and universities. Institutional commitment to the welfare of students had an indirect positive influence on subsequent commitment by increasing a student's perception of their academic and intellectual development (Braxton et al., 2014).

Surprisingly, none of the first five propositions received any empirical support. The educational attainment of the student's parents, student motivation to graduate, the cost of college, level of family support, and a need for social affiliation all had little or no impact on student persistence. Overall, this study only provided limited support for their revisions to the integration theory of student retention in commuter colleges and universities. Thus, six conclusions were derived from the results of this study (Braxton et al., 2014):

1. There was robust empirical support for their revised theory of student persistence in residential colleges and universities.
2. There was partial empirical support for their theory of student persistence in commuter colleges and universities.
3. There were identifiable direct and indirect reliable relationships that influenced student persistence.

- a. In residential colleges, there was a positive relationship between social integration and institutional commitment. Institutional commitment, in turn, had a positive impact on student persistence.
 - b. In commuter colleges, there was a positive influence between perceived academic and intellectual development and institutional commitment. Institutional commitment, in turn, had a positive impact on student persistence.
4. Organizational culture played an indirect role on student persistence. In particular, the institution's commitment to student welfare and its institutional integrity indirectly influenced student persistence.
5. Faculty play a critical role in student persistence. Students spent the most time interacting with faculty and, as such, faculty had much to do with their experience of integration or intellectual development.
6. Direct influences on student persistence continued to elude the researchers. (p. 205-211)

The results of this study indicated that for institutions that work with commuter students, it was important that students perceived that the institution had integrity and was committed to the welfare of students. Institutional integrity and commitment to the welfare of the student positively influenced academic and intellectual development, which in turn positively influences institutional commitment. There was also an indirect effect that organizational culture had on student persistence when the institution was committed to student welfare and institutional integrity.

Integration Theory in the Community College

Tinto's (1993) integration theory on student retention is often thought to be incompatible with the community college setting. A key aspect of the theory, social integration, was considered unlikely to be important to community college students. These students were often thought to be too busy to participate in many of the social aspects of college such as campus activities or student clubs. Tinto acknowledged that his theory had practical limitations in its applicability to commuter campuses because of the limited time students at these institutions spent on campus. For these students, academic involvement, such as their interactions with peers and faculty in the classroom, was more impactful on their decision to stay in college (Tinto, 1998).

In two-year colleges, social integration has been found to have had little positive influence on student retention, and in some studies, it has been shown to have a negative effect on GPA (Davidson & Wilson, 2013). Instead of social integration, academic integration has been shown to be more valuable to student retention in these settings. Davidson and Wilson speculated that the distinctions between the academic and social sphere may not be as clear as was first believed, and this distinction was insufficient to accurately capture this concept and could even be harmful in gaining further clarity on student retention.

When examining the importance of integration at the community college level, it was found that there was not a clear distinction between social and academic integration for community college students (Karp et al., 2011). Instead, social and academic integration were found to be interrelated concepts. Integration, as a unified social and academic concept, was defined as a sense of belonging on campus (Karp et al., 2011). In support of Tinto's (1993)

integration theory, Karp et al. (2011) found that community college students who reported a sense of belonging were more likely to persist than those who did not feel a sense of belonging. Further, they found that a student's participation in an information network was an important mechanism in facilitating integration.

Information networks are social relationships that facilitate the transfer of institutional knowledge. Relationships that students form that are strictly social did not have a strong influence on persistence (Karp et al. 2011). However, relationships that helped students navigate the campus environment, reach needed resources, and thus feel comfortable on campus were the type of information networks in which students needed to become integrated (Karp et al., 2011). These information networks, both formal and informal, supported student persistence.

Upon further exploration of these information networks, Karp et al. (2011) found that community college students generally developed information networks through academic activities in the classroom. For many students, it was a first-year student success course that helped them to develop their network. Thus, it seems that social and academic integration developed simultaneously through these information networks. This outcome suggested that Tinto's (1993) integration theory, which suggested social and academic were separate and distinct spheres, may need to be re-conceptualized for community colleges. This re-conceptualization brings with it the understanding that the integration process encompasses both the academic and social spheres.

Another study similar to Karp et al. (2011) came to a very similar conclusion (Deil-Amen, 2011). Noting that research has been mixed on the importance of Tinto's (1993) theory of integration for two-year and commuting students, Deil-Amen (2011) designed a study to gather

more information about students' psychological experiences with college integration. Reviewing qualitative data from interviews with two-year and commuting students, several themes emerged. A majority of the students in this study identified an institutional agent that facilitated the process of integration for them, highlighting the importance of faculty and staff interaction with students. For many students, these feelings of belonging and connection occurred in class and not during socialization that occurred outside of class. Instructors had an important role on students' feelings of belonging, particularly if instructors were perceived as approachable and provided students multiple ways to contact them. Students' connections to each other tended to be more practical, with relationships between students were mainly emerging based on academics. Students would help each other study and viewed each other warmly, but not necessarily as friends in a social sense. Students built networks to exchange information and solve problems, a type of network building that is often referred to as social capital (Deil-Amen 2011).

Deil-Amen (2011) recognized that a model that depicted social and academic integration as two separate ideas was inadequate to understanding how integration occurred in two-year colleges. This idea of social and academic separation was being re-conceptualized by scholars such as Deil-Amen and Karp et al. (2011), whose work suggested that the social and academic lives of students are interwoven. The term "social-academic integrative moments" (Deil-Amen, 2011 p. 72) is now preferred to encapsulate this concept.

In order to help students integrate into college, institutions needed to engage in proactive guidance to assist students in transcending procedural hurdles, such as registration or financial aid (Deil-Amen, 2011). Deil-Amen also emphasized close interpersonal contact with faculty as a

critical student support method, with the most common mechanisms for socio-academic integrative moments including:

1. In class interactions and dynamics.
2. Formal or spontaneous study groups.
3. Social-capital relevant interactions.
4. Mentor relationships with faculty and other staff.
5. Consistent access to communication with similar students.
6. Academically relevant clubs and activities (2011, p. 81).

Retention literature on community colleges (Deil-Amen 2011; Karp et al., 2011), has yielded a useful refinement to Tinto's (1993) integration theory. The current retention literature conceptualized integration into college not in two separate spheres, social and academic, but as one socio-academic integrative moment. Additionally, scholars have introduced the idea of social capital (Deil-Amen 2011), which is defined as the development of information networks to solve problems and overcome procedural barriers. Both of these concepts, socio-academic integrative moments and social capital, are salient to this study. A similar concept, career integration, is also important to understand student retention.

Career Integration Theory

While socio-academic integration focused on how a student integrates socially and academically with the college, career integration focused on how the college integrates with a student's career path. This is one of the key differences for students in CTE programs at the community college level as compared to their four-year university peers (Hirschy et al., 2011). Given that CTE programs focused on teaching skills that are applicable to a particular career

field as opposed to an emphasis on theory, it has been proposed that students who pursue these programs were seeking more direct links to career fields than other students. Based on this specific student focus on career skill building, an addition variable was added to retention theory beyond Tinto's (1993) original variables of academic and social integration; career integration.

A key difference between CTE students and their non-CTE peers has to do with the educational intention of the CTE student (Hirschy et al., 2011). In order for institutions to understand how to retain their students, it is necessary to assess the educational intentions of their students. To explore student educational intentions, Hirschy et al. (2011) assessed students in three categories of educational intentions based on three criteria: self-reported intention of completing a program of study, attending at least half time during their first year of enrollment, and formal enrollment in a degree program. Students who met all of these criteria were considered to be more directed than their counterparts. The more directed students were retained and completed programs at higher rates than those students who were not as directed. Students who pursued vocational programs were often more highly directed in their educational intentions than those pursuing academic disciplines. Based on these findings, Hirschy et al. (2011) developed a new conceptual model. This model is made of four interrelated aspects: student characteristics, college environment, local community environment, and student success outcomes.

The first of these Aspects, student characteristics, generated two categories: stable or malleable (Hirschy et al., 2011). Stable student characteristics are those traits that a student is unable or unlikely to change, such as one's, socio-demographic backgrounds, level of academic preparation, and different commitments and responsibilities outside of school. Student variables

that can be influenced are considered malleable and included such variables as student disposition and skills, along with educational and career goals.

The second of these aspects, the college environment, is composed of three constructs: academic and social integration, campus supports, and career integration Hirschy et al. (2011). While many theories identified social and academic integration as two separate spheres, the conceptual model proposed by Hirschy et al. (2011) referenced a blend of academic and social integration that was needed for student success. Within this model, the classroom was seen as the ideal location for these integration opportunities and was best supported by pedagogical techniques that fostered active learning and community building. Career integration was a key concept with CTE students and was located at the intersection with the college environment and the local environment. As students engaged in meaningful career-related educational experiences, the boundary between school and work may become permeable.

The third aspect was the local community environment, which provided support to compliment those available at the college (Hirschy et al., 2011). Services such as childcare, transportation, financial assistance, and legal aid can all help students as they pursue degree programs. Family members, friends, and work colleagues can be either a help or a hindrance to students in the pursuit of their educational and career goals.

The final aspect was the student success outcomes. Hirschy et al. (2011) define student success outcomes as the degree to which individual students met their educational goals. At times, this was more difficult to ascertain than through the typical success metrics used by institutions of higher education. Students in CTE programs may take only a few courses until they are able to find suitable employment. This situation meets the educational goals of that

student, but it does not fall neatly within the typical measure of student success, such as degree completion. A broader conception of student success is needed to incorporate additional measurements beyond student retention and degree completion.

Career Capital

Most models of student retention conceptualize job opportunities as something that comes after college completion. It is useful to rethink this concept (Hirschy et al., 2011). Job opportunities do not come only after college completion, and they can be a key factor in a college student's decision to persist during their enrollment. Therefore, community colleges should foster opportunities for career capital.

Career capital revolves around three ways of knowing: knowing why, knowing how, and knowing who (D'Amico et al., 2012). Knowing why refers to an individual student's purpose and motivation behind seeking a particular career, knowing how refers to expertise and knowledge necessary within a particular career field, and knowing who refers to the relationships and networks that are developed over time. Career capital is an accumulation of knowledge in each of these three ways of knowing. Based on this description, it should then become the goal of the community college to align the student experience while at the college with developing career capital that will allow students to gain employment and be successful in their chosen career.

Building on existing notions of human capital theory, social integration, and socio-academic integration, a new model of retention was developed that incorporates career capital (Stuart et al., 2014). This model incorporated a piece that was missing from previous retention models; the influence that the job market has on a community college student's decision to

pursue a particular degree and whether to persist within that degree until completion. A community college student's persistence and success in college was highly motivated by local employment circumstances and potential job prospects, and is not solely based on how the student integrated academically and socially into college (Reyes et al., 2019).

While enrolled, community college students engaged in a continual cost-benefit analysis. If they found that the perceived benefit of meeting their educational goal outweighed the financial and psychological costs of attendance, then they would choose to persist. If the costs outweigh the benefits, then students would drop out. Alternatively, students may amend their educational goal if they discovered a different career that they would like to pursue, and they may transfer to a different college to facilitate their new goals (Reyes et al., 2019).

As students continually weighed the cost and benefits of college enrollment, it became incumbent on the community college to design strategies that improved the student's cost-benefit analysis (Stuart et al., 2014). This can be done by reducing the costs of attendance and increasing the perceived benefit for students. The cost of attendance can be both financial and non-financial; grants and work-study packages can be provided to help students bear the cost of attendance. Services can be provided to address the nonfinancial costs of attendance, such as tutoring and providing childcare services.

Colleges can also help students to better understand the benefits of education by helping them to increase their career capital (Stuart et al., 2014). Career exploration and career counseling can help students to increase their college and career alignment and bring their educational goals into focus. Colleges can further increase the benefit of a college degree by involving employers in degree program development. Colleges can work with employers to

identify the degrees of highest economic value and refine curriculum to align with current industry standards.

Summary of Retention Theories

Tinto's Integrationist Theory (1993) provided a starting point for the exploration of student retention in higher education. While this theory does quite well in explaining student retention at residential colleges with traditional aged students, it is inadequate to explain student retention with commuter, post-traditional aged, and community college students (Bean & Metzner, 1985; Braxton et al., 2004). Given the potential problems noted, refined conceptual models developed by subsequent researchers (Braxton et al., 2014) provided useful concepts that apply to commuter and community college students. For commuter colleges, it was important that students perceived that the institution had high levels of concern for the welfare of its students and institutional integrity (Braxton et al., 2014). An adjusted conceptualization of integration was needed for community college students. While integration has typically been thought of as occurring in two distinct spheres, academic and social, the distinction between the two was not as stark as first thought. A new conceptualization of integration was provided by Deil-Amen (2011) and Karp et al. (2011), known as the social-academic moment. Within this concept, social relationships were thought of in terms of social capital and were utilized to garner information and to solve problems (Deil-Amen 2011).

For students pursuing career technical programs, career capital was a key concept that came into play (Hirschy et al., 2011; Stuart et al., 2014). For these students, attending college included a constant cost-to-benefit analysis. If these students perceived the cost of attending was greater than the benefits, either financial or non-financial, they will were unlikely to continue in

college. Integration into college life was only one aspect of the retention puzzle. Another equally important aspect was the student background variables that students bring with them to college.

Student Background Variables

No student comes to college as a blank slate; every student has a set of background characteristics and experiences that they bring with them to college (Tinto, 1993). These background characteristics often have profound effects on student success in college. Many researchers have approached these background characteristics as variables that can help to provide insight into the puzzle of student retention. For example, Settle (2011) developed a predictive model of community college student retention based on seven factors including; high school experience, college entry, finances, social integration, academic integration, and college performance.

In his research, Settle (2011) found seven variables that positively associated with community college student persistence. First, students who persisted in college had friends attending the same college and had social contact with faculty members outside of the classroom. Second, student age was found to be strongly associated with persistence; those students who were 21 years of age or older were more likely to persist. The third factor associated with persistence was family composition. Those who came from a family of two or three siblings were more likely to persist. Fourth, family education level impacted persistence. Students who had at least one other family member in college had an enhanced likelihood that they would persist. The fifth factor was student attendance level, with full-time attendance and a non-delayed entry from high school to college increasing persistence. Sixth, financial considerations affected whether a student persisted, including a student's satisfaction with the cost of

attendance, receiving financial aid, and the cost of living on campus. The seventh factor, higher grade point average, was also linked to a greater level of persistence.

In addition to these seven variables identified, specific variables were associated with persistence for first-generation students. Persistence was positively associated with attending a school within 150 miles of their home, being satisfied with the campus climate and the student's intellectual development, and going places with their friends.

Prior to Settle's (2011) research, Bean (2005) identified four key psychological processes relevant to retention. These processes included a student's degree of self-efficacy, locus of control, the education-employment connection, and intent to return. Self-efficacy referred to the student's belief in their ability to accomplish a given task. Locus of control described the extent to which an individual attributed outcomes to internal forces such as skill and hard work, or to external forces such as luck. The education-employment connection referred to a student's perception that their education will lead to employment. Finally, a student's intent to return highlighted the student's commitment to continuing their pursuit of education.

Between the research of Bean (2005) and Settle (2011), a wide range of variables were identified that associated with student retention. While Settle (2011) provided variables that included information related to demographic background and academic preparedness, Bean (2005) looked at psychosocial factors that affected student retention. This by no means provided an exhaustive list but served as an entry point into the discussion of student background variables.

Putting and Keeping Students on Track

Due to the variety of variables that have been explored in the retention literature, it can be hard to get a firm understanding of the implications. Burrus et al. (2013) provided a useful overview of the research on student background variables related to student retention. Burrus et al. (2013) completed a review of the retention literature and grouped the vast number of student retention variables into eight common factors: (a) institutional environment factors; (b) student-demographic characteristics; (c) commitment; (d) academic preparation and success factors; (e) psychosocial and study-skill factors; (f) integration and fit; (g) student finances; and (h) environmental pull factors. Descriptions of these variables can be seen in the table 2.1 below.

Table 2.1
*Eight Common
 Retention Factors*

Factors	Definitions	Examples
Institutional environmental factors	Institutional structural features as well as programmatic offerings at the institution	Institutional size, student advising, orientation programs, first year seminars
Student demographic characteristics	Demographic information about the student	SES, gender, race, ethnicity, first generation status
Commitment	The extent that students feel committed to their current institution and the goal of earning a degree	Institutional commitment, educational aspirations
Academic Factors	Academic ability, previous academic performance, and preparation	Academic preparation, rigor of high school curriculum, and academic success in high school and college
Psychosocial and study skill factors	Factors often referred to as non-cognitive or motivational; skills related to organizing and completing schoolwork and preparing for tests	Self-efficacy, personality, time management
Integration and fit	Students' overall attachment and sense of belonging and connection to a college environment	Academic integration, perceptions of intellectual development, social integration, involvement in extracurricular activities
Student finances	The extent to which financial hardship affect persistence including role of loans, financial aid, and grants.	Financial hardship, aid in the form of scholarships and grants, loans, work study
Environmental pull factors	The collection of forces beyond the control of the institution that can affect persistence decisions at any time	Family obligations, parental loss of job, divorce, the need to work while in college

Note: SES = socioeconomic status

These eight common factors provide a framework for this study. This framework aids in understanding the wide variety of student background variables that accompany college students. The variables explored fit within one of these common factors.

Professional Judgment

The literature review has so far examined retention theories and the various background characteristics students bring with them to college. However, putting retention theories into practice can often be difficult to accomplish (Hirschy, 2015) Theoretical concepts can be obscure and are often written for other researchers. Theoretical concepts are often not adequately described for student services practitioners who do not share the same foundational knowledge to understand retention models. Even student services administrators who have the academic or professional training to follow research often lack the time to do so (Sriram, 2011; Sriram & Oster, 2012).

Even with these difficulties, theory is an important aspect of retention efforts. All too often, retention efforts are made piece-meal, with specialized retention programs popping up as a result of the initiative of individual stakeholders. Retention theories can provide a coherent framework for institutional action (Hirschy, 2015) and can help ensure that all stakeholders are working together, not on an ad hoc basis or even at cross purposes. Professional judgement is required to discern which theory fits best with the goals of the institution and how to best implement a certain theory. The process of making these complex decisions regarding retention theory choice and implementation is often termed professional judgment, a topic that is frequently discussed in the retention literature. This section will explore the ideas of these authors on how to apply retention theory into the practice of retaining students at college.

Developing Conditions that Support Retention

Tinto (2012) suggested that knowing the causes of students leaving college and doing something about it were two different things. Acknowledging this, Tinto offered suggestions on developing college and university conditions that would encourage student retention and degree completion. These conditions included expectations, support, assessment and feedback, and involvement.

Expectations. Many students do not know what to expect when they go to college, as it is an experience they have not had before. First-generation students, who do not have anyone in their families who can guide them through the experience, have a particular lack of experience when it comes to understanding the college environment. In response to this lack of experience, students should be given clear and consistent guidance about what it will take to be successful in college. Advising and mentorship programs can provide students with a roadmap to success. Moreover, institutions should have high academic expectations for their students and should communicate these expectations to them. Students will typically respond to what is expected of them, either rising to meet high expectations or turning in only the minimum effort when that is what is expected from them (Tinto, 2012).

Support. Students need support in a variety of areas. Academic support may come in the form of tutoring, supplemental instruction, or Summer Bridge programs. During the first year of college, social support may be needed as students adjust to new social circumstances. First-year programs also aim to increase a student's self-efficacy by helping students learn to be successful in college and become more capable students. Institutions can further help to support students through financial aid programs that pay the cost of attending college (Tinto, 2012).

Assessment and Feedback. Assessment is used in a variety of different contexts on campuses (Tinto 2012). Assessments are used when students enter college to determine academic ability. Some institutions also choose to assess students in other non-academic areas, using these assessments to identify needs and provide students with specific supports. Moreover, assessment should be used as part of the feedback loop in the classroom. Students should be assessed on their performance and provided with feedback in a timely manner so that they know in what ways they need to improve. These assessments can also provide instructors with feedback on how to improve their instruction. Classroom assessments allow institutions to identify early-warning signs of student distress, allowing the university to identify those students who are struggling and intervene early in the semester before it is too late.

Involvement. Involvement is often called engagement. Briefly stated, when students are engaged academically or socially in college, they are less likely to leave (Tinto, 2012). Institutions should engage in pedagogical methods that increase student engagement, such as problem-based learning, collaborative learning, and service learning. These pedagogical methods have been found to increase levels of student engagement. Institutions can also employ linked curriculum in learning communities to increase student engagement. This linked curriculum could contain common themes that are taught through each of the classes that the students are taking.

Providing Non-Academic Supports

Karp (2016) sought to better understand student persistence in academically vulnerable commuter and two-year institutions. The goal of this undertaking was to identify the non-academic supports provided to these students that increased student retention and degree

completion. A review of related research on this topic revealed four common mechanisms that can be incorporated into retention programming.

The first of these four common mechanisms is the creation of social relationships. Programs utilizing this mechanism can help students form connections and friendships with others in the college community. The second common mechanism is to clarify aspirations and enhance commitment. These types of programs helped students form clear educational goals and develop the commitment needed to meet these goals in the face of obstacles that may arise. A third common mechanism is to develop college know-how. These programs helped teach students to navigate the college landscape both procedurally and culturally. The final common mechanism was to make college life feasible. Programs that implemented this mechanism helped students to overcome the challenges that arose outside of the classroom. Institutions who employed these four mechanisms appeared to encourage student success (Karp, 2016).

Processes over Programs

Efforts to improve persistence should focus on processes, not on programs. Creating new programs provided a mixture of results in encouraging persistence and may not provide any substantive improvements. Institutions should strive to create environments, not merely add on programs, in which these four mechanisms exist. In order to create these environments, there are several approaches that institutions can take (Karp, 2016).

First, a redesign of advising and counseling services should take place so that both services are streamlined and personalized (Karp, 2016). Students crave personal attention, but often institutions do not have the resources to provide individualized one-on-one advising. A balance can be struck that provides students with a personalized experience without requiring

large amounts of resources. This can be done by utilizing technology to make clerical and administrative tasks more efficient or even automated, thus freeing up time for advisors to devote to more personalized interaction. Even with technological aid advisors may need to prioritize their efforts to spend time with students that they can benefit the most.

Second, institutions can make non-academic supports intrusive so that students are forced to encounter them (Karp, 2016). This could be done through mandatory participation in advising or student-success courses. Early warning systems are another way to initiate intrusive support.

Finally, creating more structure within the community college could encourage student persistence. Organizing programs in a way that creates cohorts would help to provide this structure by simplifying student choices and minimizing decision points that students will encounter (Karp 2016).

Based on their research findings, Braxton et al. (2014) also provided suggestions for all institutions regarding retention approaches and programming. First, they suggested that institutions use an integrated approach that involved the coordination of all policies adopted by that institution to increase student retention. This is a strategic approach that brought together the efforts of all parties on campus into one larger effort rather than a haphazard collection of retention efforts.

The second of these suggestions consisted of a series of nine imperatives that should be followed by administrators and staff in the performance of their roles to support retention efforts across campus. These imperatives include:

1. Administrators, staff members, and clerical workers should embrace a commitment to safeguarding the welfare of students as clients of the institution.

2. In the day-to-day administration of institutional policies and procedures, administrators, staff members, and clerical workers should treat students in a fair and equitable manner
3. A respect for each student as an individual should manifest itself in the day-to-day interactions that college and university administrators, staff members, and clerical workers have with students.
4. College and university administrators should ensure that institutional policies and procedures coincide with the mission, goals, and values espoused by their college or university.
5. The day-to-day actions of college and university administrators, staff members, and clerical workers should support the mission, goals, and values of the institution.
6. The reward structure for administrators, staff members, and clerical workers should recognize those individuals who highly value students, treat students equitably, and demonstrate respect for students as individuals in their day-to-day work.
7. Institutional publications and documents should communicate, when appropriate, the college or university's abiding concern for the growth and development of its students.
8. Public speeches made by the president, chief academic officer, chief student-affairs officer, academic deans, and admissions officers should communicate the high value their college or university places on students as members of the academic community.
9. Ongoing assessments of the student experience should inform improvements in college and university policies and practices to communicate the commitment of the institution to the welfare of students. (Braxton et al., 2014, p. 39-41)

These imperatives were developed based on research findings that showed students had increased institutional commitment when they perceived the institution was dedicated to student wellbeing and demonstrating integrity. These nine imperatives were designed to increase student perception of the commitment of the institution to student wellbeing and institutional integrity.

Given that most of the students' interactions with the institution came through instructional activities, it is important to recognize the role that faculty members play in influencing student perception of institutional commitment to their wellbeing (Braxton et al., 2014). It was important that instructors had a sincere concern for the welfare of the students, as this affected student perception of the institution and subsequent student persistence. Attention to the welfare of students should be considered when selecting, orienting, and rewarding faculty.

Accurate expectations of the institution resulted in a more positive perception. For this reason, enrollment management offices in residential colleges and universities should ensure that marketing materials depict the institution accurately (Braxton et al., 2014). Students with a positive affinity for an institution have a higher initial commitment to that institution, which leads to higher persistence. Enrollment management offices can also focus their recruitment on students who are more likely to be committed to the institution, or develop student commitment by encouraging students to participate in campus visits or other on-campus events. Creating a positive affinity for an institution can also be encouraged by promoting positive interactions between prospective students and current students, faculty, and alumni. Enrollment management offices should develop strategies to reinforce student commitment after being accepted, including frequent positive communication, student participation in summer orientation, and interaction with alumni, faculty, and current students.

Good teaching also has been found to play an important role in student persistence (Braxton et al., 2014). To capitalize on this, faculty at residential colleges and universities should be provided professional development that promotes good teaching practices. Student perceptions of good teaching should be assessed through course evaluations, and good teaching should be part of the faculty reward system, recognized in a visible way through annual teaching awards.

Both residential and commuter colleges and universities should create and implement strong new-student orientation programs to prepare students for college life (Braxton et al., 2014). These orientation programs should communicate campus norms in order to help students anticipate and respond to the social challenges and demands they may encounter. Orientation programs should help students to make connections by offering multiple opportunities to meet and interact with other first-year students.

Beyond the general recommendations offered to all university types in support of retention, Braxton et al. (2014) offer some recommendations specific to commuter colleges and universities. The first of these recommendations is to design an academic advising program that meets the needs of commuter students. Advising services should be available at times that are convenient to commuter students, including evenings and weekends. All part-time students should be assigned an advisor and be required to meet with them periodically.

Second, academic programs should offer courses at times that are convenient for commuter students, including evenings and weekends (Braxton et al., 2014). This sort of flexible scheduling shows a commitment to the wellbeing of students and helps to avoid any of the environmental pull factors that a student might encounter. Commuter students should be offered

the opportunity to participate in learning communities, which may include in a series of block-scheduled courses that are organized around a central theme.

Third, commuter colleges and universities should enact an administrative policy that require first-time, first-year students to enroll full-time, as full-time enrollment is positively correlated with persistence (Braxton et al., 2014). These schools should also establish an office of family services, which can develop programs to ensure that a student's family feels welcome on campus. This office can encourage student family participation in on-campus events and develop communication materials on the college website and in print to get pertinent information out to families. Staff in the office of family services can also work with new student orientation providers to create a family version of orientation to help family members orient to college life.

Fourth, enrollment management offices should focus on the financial aspects of attending college for commuter students (Braxton et al., 2014). Programs should be developed to make it financially viable for students to attend full time. Students should be made aware of potential sources of funding for school such as financial aid, scholarships, or loans, so students feel that they are able to cover the cost of attendance. Financial counseling should also be provided so students understand not only the cost of attending college, but also the benefits of investing in their education. First-time students should be required to attend a new-student orientation regardless of whether they are attending full or part-time.

Finally, as in residential colleges and universities, teaching plays an important role in student persistence at commuter colleges and universities (Braxton et al., 2014). Teaching that utilizes active learning and demonstrates instructional clarity, organization, and preparation positively influences a student's perception of their academic and intellectual development.

Additionally, this positively influences their perception of the institution's commitment to the welfare of students and institutional integrity. This, in turn, positively influences a student's likelihood to persist. Faculty should be given the opportunity to develop these teaching practices, and good teaching practices should be acknowledged when selecting and rewarding faculty.

Tinto (2012), Karp (2016), and Braxton et al. (2014) have provided their professional judgment on the implementation of retention theory in practice. This literature review will now shift to an investigation of the specific programs and techniques that have been implemented to increase student retention.

Types of Student Retention Interventions

In contrast to the theory and professional judgment this literature review has explored to this point, retention interventions refer to the specific policies, programming and actions institutions implement with their students (Monaghan et al., 2018). This section will explore several specific retention interventions that have been implemented by colleges and universities across the US in recent years.

Specific retention interventions happen at one of three levels: student-focused interventions, school-focused interventions, or system-level interventions (Monaghan et al., 2018). Student-focused interventions offer interventions to the individual student. These come in the form of providing student support, reducing financial barriers, or improving students' academic skills. School-focused interventions attempt to change the way in which colleges serve students. These can be seen in the implementation of guided pathways, course redesign, and in restructuring student-support services. Finally, system-level interventions alter college incentive structure. This type of intervention includes a metric-based funding model or promise programs

implemented by some states.

Rather than implementing an intervention at only one level, a multidimensional approach to retention intervention is recommended by Fowler and Boylan (2010). This approach is described as a student success or retention program that includes components that address both academic challenges and social and personal challenges that students may encounter. These components include clear guidelines, first-year transition coursework that focuses on integration, intrusive advising to address nonacademic and personal challenges, developmental coursework, and tutoring to address academic deficiencies. Students that have engaged in this type of program have showed an increase in their mean grade point average and an increase in first to second year retention rates when compared to non-participating students.

In order to better understand student retention interventions and their efficacy with students Monaghan et al. (2018) reviewed research on interventions at the student-focused and school-focused levels. From their review of the research, two conclusions were drawn. First, multifaceted interventions appeared to be more effective than simple interventions, suggesting that the components of complex interventions interact with and reinforce each other. Second, many retention programs showed positive gains while they were in operation but faded afterwards. This outcome suggested that effective interventions must be prolonged to have a lasting impact. Administrators should only expect short-term impact from short-term programs.

The CFS program being reviewed in this study provided two student-level interventions through a multifaceted program. The interventions used included a student success course, proactive advising, and scholarship funding.

Student Success Courses

Student success courses are college classes designed for new students. The curriculum of these courses tends to include information about the college, academic and career planning, and study skills. Student success courses have been associated with greater levels of persistence and retention (Cho & Karp, 2013; Fowler & Boylan, 2010; Karp et al., 2017; Kimbark et al., 2017; Windham et al., 2014). These results may explain why student success courses have become pivotal for many colleges and universities retention plans (Kimbark, et al. 2017).

Students who took a student success course during their first year of college reported initially not understanding why they were required to enroll in the class. Despite their initial ambivalence towards the course, many of the students ended with a positive perception of their experience. By the end of the course, they reported increased study and social skills (Kimbark et al., 2017). The students who participated in a student success course persisted at a greater rate from first to second year (Cho & Karp 2013; Fowler & Boylan 2010; Karp et al., 2017; Kimbark et al., 2017; Windham, et al., 2014). This was true even when controlling for background variables such as awarded financial aid, ethnicity, race, sex, initial math and English placement scores, and age (Windham et al., 2014). Additionally, students who completed a student success course achieved higher average grades in math and English, which are common gateway courses (Kimbark, et al., 2017). Finally, students who had participated in a student success course had higher rates of engagement as measured by the Community College Survey of Student Engagement, which is an assessment instrument designed to measure the depth of student engagement. (Kimbark, et.al, 2017).

The benefits of participating in a student success course are even more pronounced for students who are placed into math or English course below college level (Cho & Karp, 2013). Among students who have been placed into developmental education, those who were enrolled in a student success course were more likely to complete college-level coursework than those who were not enrolled in the success course. While this study focused on short-term outcomes, the outcomes it focused on were consistent with the concept of academic momentum, which states that a student who attempts more credits per term at the beginning of their college career is more likely to complete their degree and in less time (Attewell & Monaghan, 2016).

Instructors of student success courses may use a variety of pedagogical approaches to support students. One college in particular, Bronx Community College, found an effective pedagogy for student success courses (Karp, et al. 2017). Their approach focused on learning for application; the courses provided academic content in a way that provided students with the opportunity to apply the study skills they were learning. Students who participated in these courses had, on average, higher GPAs, earned more credits, and were retained at higher rates than their peers who did not participate in the first-year experience course.

Student success courses have shown to be beneficial for students at the community college level. With some overlap between the characteristics of community college and CTE students, it may be that student success courses can also benefit CTE students. More study needs to be done specific to CTE students to verify the value of these courses for this student population.

Intrusive Advising

In addition to student success courses, another type of retention intervention that is helpful to the community college student is intrusive advising. Advising has typically been thought of as a prescriptive process where a student is told which courses to take and when to take them (Crookston, 1972). This view has evolved into a developmental view of advising in which the student is an active participant and it is the advisor's role to help the student develop academically, socially, and professionally (Crookston, 1972)

Intrusive advising is another approach to advising. The intrusive advising model began with the work of Robert Glennen (1975). While guidance counseling theories generally held that a student should seek counseling on their own, Glennen argued that in an academic setting, Glennen believed it was crucial that counselors be intrusive, and that it was ineffective to passively wait for students to come for help. Rather, advisors needed to be proactive and provide information and help to students before issues occurred. Utilizing this approach, Glennen created an intrusive advising program (Glennen & Baxter, 1985) in which students were called in for advising multiple times during a semester instead of waiting for students to come in for their once-a-semester advising session. With intrusive advising, the freshman attrition rate at Western New Mexico University decreased from 66% to 25% over two years.

In the time since Glennen's (1975) first writing, intrusive advising has been recast as proactive advising (Varney, 2012). Building on the idea of approaching students before issues arise, proactive advising also strives to create connections with students by showing interest, involvement, and utilizing deliberate interventions to increase student motivation. In practice, this typically involves closely monitoring student grades and reaching out when there is a

problem, particularly during critical times of the term. For this practice to be effective, the advisor must develop a relationship with their advisees from the very beginning and must maintain regular contact (Cannon, 2013).

Students participating in a proactive advising program reported several benefits to the approach (Donaldson et al., 2016). First, students appreciated having an assigned advisor and being required to participate in advising and degree planning. If they had not participated in these activities, many felt that they would not have understood the academic requirements of their degree. Furthermore, students felt the individualized support they received from an advisor contributed to their success. Meetings with their academic advisors helped them to develop pathways towards their educational goals and increased their confidence in their degree-planning ability. Finally, these meetings increased help seeking behavior because students were more likely to seek out an academic advisor in the future for help with any issues they experienced.

Not only does proactive advising benefit all students, but it has a specific impact on first-generation students. One study of first-generation students found a positive correlation between the number of meetings with an academic advisor and retention (Swecker et al., 2013). In fact, every additional visit with an academic advisor increased student retention by 13%. These findings seem to support a proactive advising approach, where an academic advisor initiated visits with students when necessary instead of waiting until a student reached out to an advisor.

Financial Aid

Using a career integration perspective, students pursue education that is aligned with pursuing their career goals (Stuart et. al, 2014). Within this view the student is engaged in a cost-benefit analysis concerning attending school. If the benefit of attending school outweighs the

cost than the student is likely to persist. By reducing direct costs to the student financial aid can be an intervention that will influence a student's decision to persist (Yang, & Venezia, 2020).

Many rural community college students are very dependent on financial aid, with the majority receiving Pell Grants (Kennamer et al., 2010). Federal aid programs are strongly associated with degree completion (Yang & Venezia 2020). However, rapidly rising college costs have outpaced increases in needs-based grant aid (Goldrick-Rab et al., 2016). Consequently, the purchasing power of the Pell Grant has been reduced. Scholarship awards are one way that could offset the reduced purchasing power of Pell Grants.

Data from two statewide scholarship programs indicated overall positive impacts for the scholarship recipients. However, when data was disaggregated, two-year college students did not fare as well as those students attending four-year colleges. A study of the Wisconsin Scholars Grant found that one-year retention rates increased by 3.7% at University of Wisconsin branch campuses but decreased by 1.5 % at Wisconsin Technical Colleges (Anderson & Goldrick-Rab 2016).

Data from a study of the Buffet scholarship indicated that the scholarship dis-incentivized two-year college attendance. Buffet scholarship recipients received \$5300 per year for up to five years. Recipients of this scholarship were 7% less likely to attend community college (Monaghan et al., 2018)

Fourteen states have developed their own needs-based scholarship programs (Kelchen et al. 2017). These college promise programs take different forms, but all of them are attempting to mitigate the rising cost of college tuition. The first variation in design of these promise programs are the types of institutions that the funding can be applied towards. Some states have limited the

promise funding to only two-year institutions while others have opened it for two-year, four-year, and even private colleges. Another design variation is whether the promise program is first-dollar or last-dollar funding. First-dollar funding is applied before any other funding. This means if there is any excess after everything is applied it would be remitted to the student for living expenses. Last-dollar indicates that it is applied after federal aid has been applied and will only cover any unmet need that exists.

The final design variation is the age of students who are eligible. Most promise programs target students just out of high school encouraging them to continue after high school graduation. They limit students' eligibility to the program to either immediately after high school graduation or a year or two following high school graduation. The most generous of these programs allows participation for up to ten years following high school graduation. Research on these programs indicated that they increase enrollment and completion (Kelchen et al. 2017).

Financial aid is associated with increased rates of completion and retention (Goldrick-Rab, 2010; Goldrick-Rab et al., 2016; Kelchen et al. 2017; Monaghan et al., 2018). The purpose of aid programs is to reduce the direct cost to the student. The CFS program utilized a \$500 first-dollar scholarship that reduced the cost of attendance to the student, and incentivized participation in the other aspects of the program.

Career Technical Education Students

These retention interventions are a good starting point for future research into which retention efforts may work best for CTE students. Fortunately, CTE programs have some potentially positive attributes already within the curricular structure. However, further

improvement of retention efforts specifically for CTE students can benefit both students and the institution.

One thing that CTE programs tend to do well is to provide structure to students. The concept of structure follows the guided pathways ethos (Bailey et al., 2015); rather than allowing students to fumble around trying to cobble together their own plans for study, a structured program provides a default curriculum to guide both students and advisers.

A study was conducted that looked at the concept of structure in career technical programs (Van Noy et al., 2016). Four dimensions of structure were identified in this study: program prescription, program alignment, access to information, and active program advising and support. Program prescription described the level of flexibility in a given curriculum. Programs with high levels of program prescription permit little deviation from the prescribed curriculum. Program alignment referred to the level that a program was aligned with industry or with further educational opportunities. Access to information related to the way information about policies and courses were conveyed to students. Finally, active program advising and support referred to how proactive advising staff were in providing guidance to students to help them make decisions and overcome barriers.

When reviewing career technical programs for structure, it was found that all programs had high levels of program prescription and program alignment (Van Noy et al., 2016). While levels of access to information and active program advising were still quite high, they were not as high as the other dimensions. However, the highly prescriptive nature of these programs may eliminate the need for access to information and active advising.

CTE students consistently identify their relationship with their program instructor as one of the important factors that helped them to complete their degree (Daulton, 2015; Nadel et al., 2017; Van Noy et al., 2016). When asked for suggestions on what could be done to help overcome the challenges they faced, many of the students suggested improvements to student support services (Nadel et al., 2017; Van Noy et al., 2016). Among the suggestions was the need for administration to communicate information about policies and requirements more effectively to students (Nadel et al., 2017). Additionally, it was suggested that advisors take the time to get to know students and do a better job keeping students on track.

In fact, the disconnect was so pronounced between CTE students and student services that in one study, students did not even understand the term student support services. When asked in which ways student services had supported them while pursuing their degree, the most common student response was that they did not help. There was not any action that students could name that was taken by student services that helped them to stay enrolled (Daulton, 2015).

Surprisingly, surveyed staff members echoed the perception of the students (Daulton, 2015). Only about half of staff members surveyed agreed that students stayed enrolled at TCAT because of the student support services available to them. While staff members indicated that they believed that student support services contributed to student success, they did not provide a real consensus on the role of student services in student persistence.

With the seemingly low impact of student services on CTE student retention, the implementation of student success courses and proactive advising may offer a solution to the barriers that CTE students have described. Students identified the need for administration to communicate information about policies and requirements more effectively to them, and students

also wanted their advisor to take the time to get to know them and do a better job keeping students on track (Nadel et al., 2017). Student success courses may provide an avenue for information to be disseminated to students in a timely and accurate manner. Because of their sustained interaction during class, career technical students can develop a relationship with their instructors. A student success course would provide a similar opportunity for career technical students to build a relationship with student services personnel as well.

Proactive advising offers an additional way to strengthen the relationship initially developed in the student success course. It also offers a way to better keep students on track academically. Instead of waiting for students to initiate contact when the encounter trouble advisor become proactive and reach out to students when they were in danger of falling behind or deviating from the prescribed curriculum.

These specific interventions, student success courses, proactive advising, and scholarship funding align with the literature reviewed in the professional judgments section. Through the student success course and proactive advising, students can be given clear and consistent guidance about what it will take to be successful in college (Tinto, 2012). Student success courses and proactive advising are a way to support students as they strive to meet the high academic expectations that the institution has for them.

The four common mechanisms that promote retention can also be promoted through student success courses and proactive advising (Karp, 2016). The student success course can be an avenue for students to form connections and develop social relationships. These interventions can also help students clarify aspirations and enhance commitment. This could be done by promoting career integration in the program of study they are pursuing. Additionally, it can help

students form clear educational goals and develop the commitment needed to meet these goals in the face of obstacles that may arise. The student success course and proactive advising can also help students to develop college know-how. These programs can help teach students to navigate the college landscape both procedurally and culturally, helping make college life more feasible (Karp, 2016). Finally, student success courses and proactive advising can help to increase student perception of the commitment of the institution to student well-being and of that institution's integrity, both of which have been found to influence retention (Braxton et al., 2014).

Based on the positive impact of these types of interventions on community college students, it seems that the application of these retention interventions may be of benefit to CTE students as well, with some interventions appear to be more promising than others. Still, more research needs to be done to determine which interventions will be most beneficial for CTE students.

Chapter III: Methodology

Multifaceted retention programs have shown to be a promising tool to improve retention and completion rates in post-secondary education. From the literature it is clear that traditional theories of retention are insufficient for our understanding of post-traditional and CTE students. More recent retention theories support a better understanding of the retention issue with these populations. The literature has also provided more information about how professional judgment was utilized to move theories into practice. Additionally, it has also provide clarity on the effectiveness of each of the specific intervention involved with the Connect for Success (CFS) program; a student success course, proactive advising, and tuition and financial support.

This chapter provides the methodology for this study, including the purpose of the study, the philosophical approach, the methodology for the study with research questions, the sample selection, the data and sample descriptions, the variables, validity and reliability, and ethical considerations. This study involved a statistical analysis of students who participated in CFS, a targeted retention program, between the spring 2014 and fall 2017 semesters. This study utilized archival data to compare descriptive statistics and used logistic regression to determine which variables improved the odds of student degree completion.

Participants in this study were all students enrolled in career technical programs. All student participants were commuter students, as the study institution did not provide campus housing. The majority of participants were post-traditional aged students. The concepts introduced in the literature of commuter, community college, and career-technical students were implemented in the CFS retention program.

Purpose of the Study

The purpose of this study was to expand the literature on student retention by specifically exploring the effect of a multifaceted retention program with CTE students. Many theoretical models of retention are based on four-year residential colleges (Braxton et al., 2004; Braxton et al., 2014; Tinto, 1993). A few models have been adapted to the community college setting (Deil-Amen 2011; Karp et al., 2011). However, most of the research that has been conducted on multifaceted retention programs has been conducted on students who are pursuing academic programs or with students who are in short-term workforce training (Glosser et al., 2018; Miller et. al, 2020; Sommo et al., 2018). This study explored the effect of a multifaceted retention program on students pursuing certificates or associate degrees in CTE programs. This study helped to fill that gap in the retention literature.

This study examined the relationship of participation in this targeted retention program, CFS, on the completion of CTE students. The CFS Program at Eastern Idaho Technical College utilized three programmatic aspects that have been shown in the retention literature to have positive effects on student retention: a student success course, proactive advising, and scholarship money.

Philosophical Approach

The researcher's philosophical approach to this study was post-positivist. Post-positivism holds the position that knowledge is based on the observation and measurement of an objective reality (Creswell, 2014). This deterministic philosophy states that relationships in this objective reality can be simplified into probable cause and effect. This approach is sometimes referred to

as the “scientific method” (Creswell, 2014, p. 6). This approach encourages the testing of an existing theory through the development of testable hypotheses.

Method and Rationale

This study used a non-experimental quantitative design to explore the relationship between participation in the CFS program and the rate of persistence to degree completion. This is not a true experimental design because the participants self-selected into their respective groups. This has led to selection bias and causal relationships could not be determined.

Initial statistical analysis was done by comparing different aspects of CFS participants with non-CFS participants including; sex, dependents, Pell eligibility, first-generation status and completion. A Chi-Squared Test of Significance was used to determine whether the difference between groups was statistically significant. Statistical significance occurs when the expected value for a variable was different than the observed value; and is computed using the formula:

$$\frac{(E - O)^2}{E}$$

Crosstabulation was not possible with the age variable, since it is a continuous variable. Greater detail is given in the sample description about age and how it was distributed in both the CFS and non-CFS group.

Further analysis was then needed to determine whether the difference, if any, was due to participation in CFS or could be better explained by another variable. Logistic regression was determined to be the best analysis technique for this problem. This was due to the flexibility logistic regression provides, given that the dependent variable in this study was categorical and the independent variables included both continuous and categorical variables. Logistic regression

is a statistical analysis that can provide a measurement of whether an independent variable has any effect on the probability that the dependent variable will fall into one of the defined categories (Mertler & Vannatta Reinhart, 2017). This is done by transforming each variable into a logit which is an expression of the odds that a variable will fall into a particular category. For example, the logit of the sex category will provide a score indicating the odds of a student being either male or female (Vogt 2007). Once logits are calculated it can then be determined whether there is a relationship with the dependent variable, similar to a typical linear regression. This is expressed in the formula:

$$l = \log_b \frac{p}{1-p} = \beta_0 + \beta_1 x_1 + \beta_2 x_2$$

In this study, the dependent variable was degree or certificate completion. Logistic regression was utilized to determine if participation in the CFS program increased a student's odds of completing a degree program.

Another benefit of using logistic regression was that it did not require that any assumptions be made about the dependent variables (Mertler & Vannatta Reinhart, 2017). This means that dependent variables do not need to be normally distributed, linearly related, or have equal variance within each group. However, logistic regression is sensitive to high correlations among independent variables. If multicollinearity is present among independent variables, it can affect the outcome of the analysis. To check for multicollinearity, a correlation matrix was performed to see how closely the independent variables were correlated. The strongest correlation was between post-traditional age students and students with dependents with a

Pearson Correlation value of $r = .425$. None of the correlations were above $r = .5$. The complete correlation matrix can be seen in Appendix A.

The six independent variables selected for this study included participation in the CFS program, age, sex, first-generation student status, Pell eligibility, and whether or not a student had dependents. These independent variables were analyzed to determine which contributed most strongly to the dependent variable of degree completion.

Research Questions

This study addressed two research questions:

1. Does participation in a retention program affect student retention and completion?
2. What other factors are associated with retention and completion among CTE students?

Sample Selection

At the time of this study, EITC was a small technical college in rural Idaho that offered career technical education programs but no transfer degrees. Since the time of this study, it has transitioned into the College of Eastern Idaho and has started to offer transfer degrees. At the time of data collection for this study, the institution offered only career technical education programs.

The study institution received a grant to develop a student support program. The study institution created the CFS Program. Participants enrolled in the program received financial support in the form of a \$500 scholarship and were required to attend a student success course. The student success course was crafted to teach college skills and facilitate students' connection with each other. Connecting with other students aided the students in their socio-academic

integration into the college. Students' academic progress was monitored, and proactive advising procedures were utilized to intervene when issues occurred.

The study sample consisted of all students who attended the research institution between the 2014 spring semester and 2017 spring semester. The sample consisted of two groups: those students who participated in the CFS program and those who did not.

Participation in the CFS program was optional, and students self-selected to be part of the program if desired. To participate, students applied to the program and were accepted to a limited number of seats, with priority given to students who were first-generation, GED recipients, or low income. While priority was given to students meeting these criteria it was not required for participation and students were accepted to the program who did not meet these criteria. Students were interviewed by the program coordinator to determine the specific challenges that they were experiencing and to see if they were a good fit for the program. Ultimately, there were fewer students applying for the program than there was space available so no applicants were turned away from participating in the program.

Because this study used a non-random sample, selection bias could be a major limitation for the study (Vogt, 2007). When selection bias is present, a researcher cannot determine whether the difference in outcomes is due to the treatment, participation in the CFS program, or the fundamental differences with the participants that lead to the initial selection. Students who applied for the CFS program may have had inherently higher levels of motivation, self-efficacy, or college going know how.

Data and Sample Description

Archival data was retrieved from the study institution's Colleague database. Information in the database was populated from the student's application for admission and from the student's financial aid application. An Excel spreadsheet was obtained from the Office of Institutional Research with information relevant to the study. Included in this database were age, sex, ethnicity, first-generation status, Pell eligibility and whether the student had dependents. This data set consisted of 2,240 individual student records.

All students in the study were pursuing a certificate or associate degree in CTE offered by EITC. Data was not provided on the particular degree that a student was pursuing. Therefore, it was not possible to determine what percentage of the total population was pursuing certificates as compared to associate degrees, or whether there was a difference between the CFS and non-CFS groups.

Upon receiving the dataset, student records were checked for completeness. All information was found to be complete except for the data on whether a student had dependents or not. This was due to data from this variable being collected from student financial aid applications. Therefore, if a student had not completed a financial aid application, information was unavailable on the status of their dependents. To handle this issue, the researcher chose to do the following: if a student's dependent status was unknown, their record was removed from the data set. In total, 625 records were removed from the data set, leaving 1,615 individual student records in the data set.

After data cleanup, most race/ethnicity demographic categories were left with very small numbers. It was determined that the sample lacked the robustness necessary to support inclusion

of race/ethnicity as a variable for study. Consequently, race and ethnicity were removed as a variable from the statistical analysis. All statistical analysis was performed on the finalized data set utilizing SPSS 26. Remaining demographic information can be seen in Table 3.1. As can be seen in the table the two groups are relatively similar in composition and make acceptable comparison groups.

Table 3.1
Demographic Information

Variable	Total Population		CFS		Non-CFS	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Sex						
Male	604	37.4	86	41.1	518	36.8
Female	1,011	62.6	123	58.9	888	63.2
Rae/Ethnicity						
American Indian	15	0.9	4	1.9	11	0.8
Asian	16	1	1	0.5	15	1.1
Black/Af. Am.	6	0.4	2	1	4	0.3
Haw. /Pac. Islander	4	0.2	0	0	4	0.3
Hispanic/Latino	262	16.2	42	20.1	220	15.6
Non-Resident Alien	1	0.1	0	0	1	0.1
Two or More Races	13	0.8	2	1	11	0.8
Unknown	32	2	1	0.5	31	2.2
White	1,266	78.4	157	75.1	1109	78.9
Pell Eligibility						
Yes	1,029	63.7	159	76.1	870	61.9
No	586	36.3	50	23.9	536	38.1
Dependents						
Yes	761	47.1	93	44.5	689	47.5
No	859	52.9	116	55.5	738	52.5
First-Generation Student						
Yes	831	51.5	117	56	714	50.8
No	784	48.5	89	44	392	49.2
Completer						
Yes	756	46.8	114	54.5	642	45.7
No	859	53.2	95	45.5	764	54.3

Participant age in this study is defined as the current age of the participant when the data was received on October 2018. The mean age of the population was 31.5 years of age. The mean age of the CFS group was 31.3 years of age and the mean age of the non-CFS group was 31.6 years of age. Each of these groups followed a right-skewed distribution, with more instances of students in between 20 and 30 years of age and tailing off as age increased. This can be seen in the figures below.

Figure 3.1

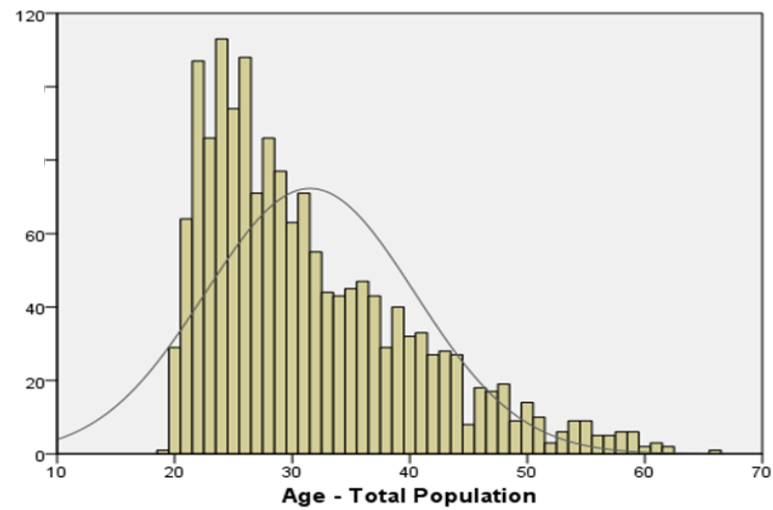
Age Histograms-Total

Figure 3.2

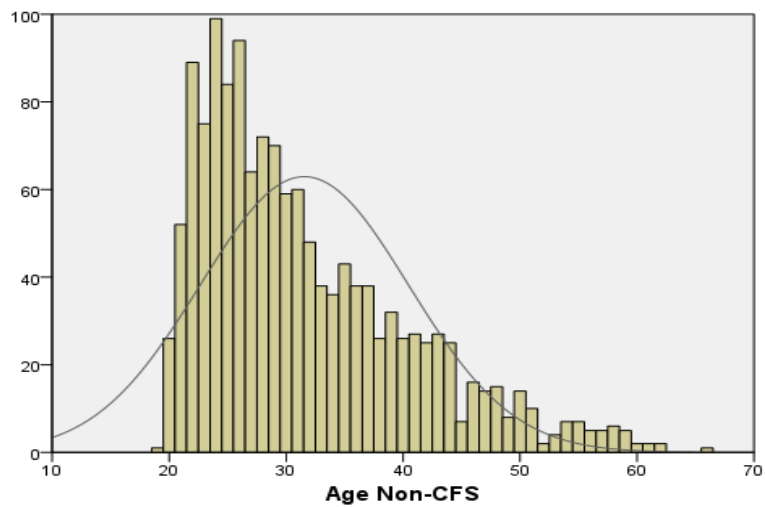
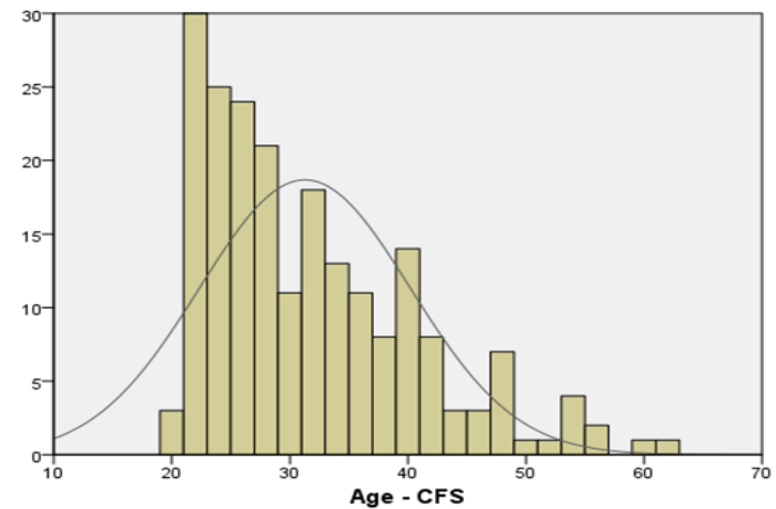
Age Histograms-Non-CFS

Figure 3.3

Age Histograms-CFS

Variables

For the selection of independent variables, this study utilized the eight common factors identified by Burrus et al. (2013) as a framework: institutional environment factors, student demographic characteristics, commitment, academic preparation and success factors, psychosocial and study skill factors, integration and fit, student finances, and environmental pull factors. All of the independent variables chosen for this study correspond with one of these factors. The independent variables included: a) participation in the Connect for Success program b) first-generation student status c) if a student has dependents d) Pell eligibility) age f) sex. The dependent variable in this study was the completion of a degree or certificate. Variables are detailed in Table 3.2. It would have been preferred to have variables from each of the factors identified, however due to the limitations of the archival data, it was only possible to use data representing a few of the factors. Sex was particularly troublesome; the researcher would have preferred to include gender as the variable examined, so as to include a broader conception of gender along a continuum. However, although the application for admission asked for gender what was meant by the question was biological sex. Therefore, the variable that was included in the study was biological sex.

Table 3.2

Description of Variables

Variable Type	Factor	Variable	Description
Independent	N/A	Connect for Success	Indicator variable coded 1= Connect for Success participation and 0 = no Connect for Success participation
Independent	Demographic	First-Generation Student	Indicator variable coded 1= First-Generation Student and 0 = not a First-Generation Student
Independent	Environmental Pull	Dependents	Indicator variable coded 1= student had dependents and 0 = student had no dependents
Independent	Student Finances	Pell Eligibility	Indicator variable coded 1= Pell Eligible and 0 = not Pell Eligible
Independent	Demographic	Age	Current age as of date of data retrieval. Measured as a continuous variable
Independent	Demographic	Sex	Indicator variable coded 1= Female and 0 = Male
Dependent	N/A	Completion	Indicator variable coded 1= completion of degree or certificate and 0 = no completion of degree or certificate

Validity and Reliability

Reliability refers to consistency of measurement or design. (Vogt 2007). The design of this study is consistent in that the methodology can be replicated in other settings. The logistic regression method could be applied in studies at other colleges with similar students. The greatest threats in reliability of measurement in this study were in the age and sex variables. Data

for the sex came from the application for admission which asked for a student's gender when the information that was needed was the student's legal sex. The confluence of sex and gender in this situation created difficulty in reliably measuring this variable. Data for the age variable in this study came from the student's current age as of the date the data was received, October 2018 not necessarily the age of the student when they were attending EITC. This gave an approximation of the age of the individual when they participated in the study but threatens the reliability of the age measurement.

A potential threat to the internal validity of this study were errors in measurement of the variables. Data was extracted from the student database system, which could have been entered incorrectly. Additionally there were a limited number of variables chosen for inclusion in the logistic regression. It is possible that variables that have been omitted had a greater effect on student completion. It would have been preferable to have variables from each of the factors identified by Burrus et al. (2013).

The data for this study was gathered from students pursuing CTE programs at a single institution in rural Idaho. It is likely that the results of this study have limited external validity and may not be generalized to other institutions and students.

Ethical Considerations

The study was submitted for approval to the Human Subjects Committee at the researchers host institution. Due to the study's use of archival data, it was determined that this study did not meet the definition of human subjects research and consequently was exempt. Permission to access data at the study institution was requested and granted by the researchers' Institutional Review Board. Participants in the study were given unique identity numbers, so no

names were used. Reporting of data was done as an aggregate and unique identifying information was used.

Summary

This chapter presented the purpose of the study. It also included the philosophical approach, the methodology for the study with research questions, the sample selection, the data procedures, and ethical considerations for this study. The results of the study will contribute positively to the body of research on retention and particularly to retention within CTE programs.

Chapter IV: Results

Multifaceted retention programs have shown to be beneficial in addressing the retention and completion issue faced by colleges and Universities. The literature review provided information on retention theories and the specific interventions used by the Connect for Success (CFS) program in this study. The study used a stepwise logistic regression to determine if the CFS program had an effect on the completion rate of CTE students.

This chapter details the results of the study, starting with the sample description and preliminary analysis. Results of logistic regression are presented next, including answers to the two research questions. Finally, key findings of the study are presented.

Preliminary Analyses

A total of 1,615 participants were included in the study. A preliminary analysis of the sample provided some context to the study and a deeper understanding of the study's results. To better understand the effect that participation in the CFS program had, a comparison was made between the participants in the CFS program to those who did not participate. When the sample was broken into those who participated in the CFS program and those who did not, similarities were found between the two groups. A total of 209 students in the sample participated in the CFS program, while 1,406 students did not. Details of the two groups can be seen in Table 4.2 below.

Table 4.1

CFS Crosstabulation of Sex Pell Eligibility, Dependents and First Generation Status

CFS			Non-CFS		
Variable	<i>n</i>	%	<i>n</i>	%	p-value
Sex					
Male	86	41.1	518	36.8	0.23
Female	123	58.9	888	63.2	
Pell Eligibility					
Yes	159	76.1	870	61.9	0.00
No	50	23.9	536	38.1	
Dependents					
Yes	93	44.5	689	47.5	0.438
No	116	55.5	738	52.5	
First-Generation Student					
Yes	117	56	714	50.8	0.161
No	89	44	392	49.2	

Note: Bold Indicates Chi-Square tests revealed differences in percentage as significant differences at the $p < 0.05$ level

The two groups were found to be similar in composition. The only difference between the two groups that was statistically significant was that of Pell eligibility: the CFS group contained a far greater percentage of Pell eligible students than the non-CFS group. This difference is expected given that as part of the screening process for application to the CFS program, priority was given to low income students.

At the time the data were analyzed, there was an overall completion rate of 47.4% ($n = 724$) within the entire sample composed of both groups at the study institution. When the completion rate was broken down by group, CFS participants had a completion rate of 53.7% (n

= 107). The non-CFS group had a completion rate of 46.4% ($n = 712$) as illustrated in Table 4.2.

A Chi-Square test showed this difference to be significant with a p value of .016.

Table 4.2

CFS Crosstabulation of CFS Participation and Completion

Variable	CFS		Non-CFS		p-value
	<i>n</i>	%	<i>n</i>	%	
Degree Completion					
Yes	114	54.5	642	45.7	0.02
No	95	45.5	764	54.3	

Note: Bold indicates Chi-Square tests revealed differences in percentage as significant differences at the $p < .05$ level

As positive as this data may appear, it is insufficient to definitively state that the CFS program had a positive effect on student retention and completion. It could be that student persistence and completion was better explained by a different student variable that was co-occurring with participation in the CFS program or that CFS students were not representative of other students given that they self-selected for the program. To better address this question, the effect of each student variable should be analyzed while controlling for the effect of other variables. Logistic regression was used to complete this task.

Research Questions

1. Does participation in a retention program affect student retention and completion?
2. What other factors are associated with retention and completion among CTE students?

To examine these research questions, logistic regression was used to find which independent variable best predicted the dependent variable of persistence. The independent

variables chosen were the students' age, sex, status as a first-generation student, Pell grant eligibility, whether they had dependents, and participation in the CFS program. These variables were selected from available archive data that fit within the assumed retention variable framework from Burrus et al. (2013). Variables were added in a stepwise regression until all of the variables were present in the model as can be seen in Table 4.3. Complete stepwise regression tables can be seen in Appendix B.

Table 4.3

Stepwise Logistic Regression
(*n*=1,605)

	Step 1		Step 2		Step 3		Step 4		Step 5		Step 6	
	Odds Ratio	B	Odds Ratio	B	Odds Ratio	B	Odds Ratio	B	Odds Ratio	B	Odds Ratio	B
CFS	1.428	0.356	1.322	0.279	1.362	0.309	1.365	0.311	1.358	0.306	1.369	0.314
Pell Eligibility	*	*	1.796	0.586	1.713	0.538	1.718	0.541	1.713	0.538	1.664	0.509
Age	*	*	*	*	1.042	0.042	1.043	0.042	1.044	0.043	1.041	0.04
FGS	*	*	*	*	*	*	0.955	0.046	0.963	0.038	0.956	0.045
Sex	*	*	*	*	*	*	*	*	0.889	0.117	0.864	0.146
Dependents	*	*	*	*	*	*	*	*	*	*	1.154	0.143
Constant	0.84	0.174	0.582	0.541	0.161	1.825	0.164	1.807	0.171	1.767	0.181	1.708

Note: Bold indicates results are significant at the $p < .05$ level.

In logistic regression, the effect of the independent variable on the dependent variable is seen in the odds ratio. If the independent variable had no effect on the dependent variable, the odds ratio would be 1.0. An odds ratio greater than 1.0 indicates increased odds of the dependent variable occurring (Vogt, 2007). This holds true only when an independent variable proves to be statistically significant. In the case of this study, a statistically significant variable with an odds ratio greater than 1.0 indicated increased odds that a student would complete a degree or certificate. The converse of this was also true: an odds ratio less than 1.0 indicated decreased odds that a student would complete the degree.

Age (odds ratio = 1.041), being Pell eligible (odds ratio = 1.664), and participation in the CFS program (odds ratio = 1.369) all increased the odds of student degree completion. Sex, having dependents, or being a first-generation student did not have a statistically significant effect on a student's odds of degree completion in this study.

Key Findings

Using descriptive statistics to analyze study participants, it was expected that participants enrolled in the CFS program would have higher levels of barriers to completion. This was largely due to the fact that the application process gave priority to students who were low income or first generation. In practice this was found to be true; when compared to non-CFS students, the CFS group contained a greater percentage of first-generation students. In previous studies, first-generation students have been found to complete college degrees at lower rates (Burrus et al., 2013). Additionally, the CFS group had an increased percentage of Pell-eligible students as compared to the general population. Pell eligibility could be a proxy indicator of socioeconomic

status, since only lower-income students qualify for Pell grants. Low socioeconomic status has been correlated with lower rates of persistence (Goldrick-Rab et al., 2016).

However, participants in the CFS program also had some background characteristics that were positively associated with persistence. While Pell eligibility may be a proxy for lower socioeconomic status, it is also an indicator of increased financial support for a student. Increased levels of financial support for college are correlated with higher completion levels (Goldrick-Rab et al., 2016). Additionally, the CFS group had a lower percentage of students with dependents and a higher percentage of traditional-age students. Based on these two factors, it is likely that the students had fewer family obligations and other environmental-pull factors that would interfere with their ability to complete coursework. With this combination of background characteristics, it was difficult to tell whether the increased percentage of completers in the CFS group was due to participation in the program and not due to one of the other variables of the group.

The results of this study suggest that participation in the CFS program was associated with increased rates of completion. Using a chi-squared test of significance to compare the percentage of students who complete their degree from the non-CFS group, there was a statistically significant difference of 8.8%. CFS participants had a 54.5% completion rate and non-CFS students had a 45.7% completion rate. Additionally, results from the logistic regression showed that participants in the CFS program had an odds ratio of 1.369. This indicated that after controlling for other variables in the model, students who participated in the CFS program were 1.369 times as likely to complete their degree as students who did not participate in the CFS program. The odds ratio for the CFS variable remained relatively consistent with each of the

steps as other variables were added. A decline in the CFS odds ratio came in step 2 when Pell eligibility was added as a variable. This decline likely occurred due to the large percentage of CFS participants who were Pell eligible and a portion of the odds that the CFS students would complete their degree was better explained by Pell eligibility.

It is important to consider the limitations of this study when interpreting these results. CFS participants self-selected into the program through an application process, which may have caused selection bias and made it difficult to determine whether the increase in the odds ratio associated with participation in the CFS program was due to the program itself or another confounding variable that was not being measured (Vogt, 2007). Therefore, it is not possible to attribute causality between participation in the CFS program and increased rates of completion.

Data from the logistic regression indicated that besides participation in the CFS program, two additional variables influenced completion: age and Pell eligibility. Age had an odds ratio of 1.041, while Pell eligibility had an odds ratio of 1.664.

The result indicating that Pell eligibility was associated with an increased likelihood of completion was not entirely surprising. In many ways it depends on what Pell eligibility is considered to be an indicator of. If pell eligibility is viewed as an indicator of increased financial support than the results were consistent with the research around financial support (Goldrick-Rab, 2010). It is clear that a student's ability to pay for college has a part to play in whether they will persist in college, and greater financial support can lead to greater rates of completion.

However, if Pell eligibility is viewed as a proxy for socioeconomic status, then this result is quite surprising. Lower socioeconomic status is typically correlated with lower rates of completion (Burrus et al., 2013). It is thought that this may be in part due to the lack of resources

and social capital that students with lower economic status bring with them. The research in this area has dealt mostly with residential universities, commuter schools, and community colleges. There is a dearth of research that deals directly with CTE programs and lower socioeconomic background. It could be that students from a lower economic status complete at higher rates in CTE programs than those from higher socioeconomic status. Students whose parents have gone to college provide a great deal of cultural and social capital to their children that is beneficial in completing academic programs (Goldrick-Rab, 2010). In a similar manner, it could be that students from lower socioeconomic status had cultural and social capital from blue collar backgrounds that better enabled them to navigate CTE programs.

The finding that for every year increase in age a student was 1.04 times as likely to complete was somewhat surprising. Post-traditional age students are widely considered to be at higher risk for non-completion than traditional-aged students (Burrus et al., 2013). However, research on the subject offers mixed results. Overall, traditional-age students have a higher 6-year graduation rate than their post-traditional counterparts (Miller, 2014). One study conducted at a community college setting found that older students were more likely to obtain a two-year degree and not transfer, while younger students were more likely to transfer without completing a degree (Porchea et al., 2010). Younger students may be more mobile and able to relocate to pursue higher education opportunities that fit their academic and career interests. On the other hand, older students may be more place bound. Older students may also have work and family obligations that keep them from being able to transfer to other colleges or universities. This limits their educational options to what is available to them locally and consequently, can have effects on their commitment to the institution.

The connection between age and increased degree completion could also be a matter of motivation; higher levels of motivation have been associated with greater levels of degree completion (Porchea et al., 2010). Post-traditional students likely have higher levels of motivation to complete a college degree. Adult students often have more obligations outside of school that demand their attention. For them, the decision to pursue a college degree is a very practical one. They see it as a way to better meet the obligations that they have.

Of interest to the researcher was also the possible suppression effect that may have occurred between participation in the CFS program and age variables. When age was added as a variable to the logistic regression model, the odds ratio and significance of the CFS program increased. One explanation for this could be the concept of social integration. Deil-Amen (2011) described social integration among community college students as the ability to develop social networks and build social capital to solve problems. It may be that post-traditional aged students are more adept at social networking and developing social capital. It is likely a skill that they would have had to develop in their everyday lives to accomplish a multitude of tasks, whereas traditional-aged students have not yet had to master this skill in their everyday lives. This is consistent with several studies within the field that showed a small, yet significant, positive correlation between age and summed total social integration scores (Mertes, 2015a; Mertes 2015b). Additional studies have found a significant correlation between age and social integration for students pursuing a transfer degree but not for students who were completing career technical degrees. The effect of social networks and social capital in the retention and completion of CTE students and post-traditional aged students in particular is another area for future research.

Chapter V: Discussion

Multifaceted retention programs have shown to be useful in addressing the retention issue faced by colleges and university. The literature review provided some context on retention theories and specific interventions that aid in the understanding of why these programs are effective. This study used a stepwise logistic regression to determine whether the Connect for Success (CFS) program had an effect on the completion rates of CTE students. The results show that participation in the CFS program was associated with increased rates of completion.

This chapter discusses the results presented in Chapter IV and provides some conclusions. It also presents connections between this study and prior research and outlines the contributions that the current study can make to the existing body of retention research and literature. This leads to a discussion of the implications for future research. This chapter concludes with implications for policy and practice of student services.

Discussion of Interpretation and Findings

The sample of this study consisted of two groups attending EITC between the 2014 spring semester and 2017 spring semester: students who participated in the CFS program and student who did not participate. This study explored the effect of six variables on student degree completion: participation in the CFS program, age, sex, first-generation status, Pell eligibility, and whether a student had dependents or not. The study was guided by the following two research questions:

1. Does participation in a retention program affect student retention and completion?
2. What other factors are associated with retention and completion among CTE students?

Archival data were obtained from the EITC, including data related to the six independent variables and one dependent variable (degree completion) used for this study from a total of 1,615 participants. Logistic regression was utilized to determine which factors influenced the completion rates of students in the study. A comparison of completion rates of CFS participants and non-CFS participants showed a statistically significant difference of 8.8%. Additionally, the results of the logistic regression indicate that after controlling for other variables in the model, students who participated in the CFS program were 37% more likely to complete their degree relative to students who did not participate. This evidence shows that participation in the CFS program was associated with increased odds that a student would complete a degree or certificate.

Results of the logistic regression indicated that besides participation in the CFS program, two additional variables significantly contributed to completion: age and eligibility for Pell grants. For every year increase in age, a student was 1.04 times as likely to complete their degree. Students who were Pell eligible had an odds ratio of 1.664 or two thirds more likely to complete their degree than those who had not received Pell grants. The other three variables (sex, first-generation status, and whether a student had dependents) were not associated with increased odds of degree completion.

Implications for Research

Participation in the CFS program was associated with increased odds of completion. Although no causal relationship can be claimed from this study, the results are encouraging enough to warrant future studies. Studies should continue to investigate the relationship between retention programs and completion in of CTE programs to determine whether this association is

due to the types of interventions received through the CFS program and other similar programs, or if it can be better explained by another variable that was not accounted for in this study.

Perhaps this study's largest limitation was selection bias. Selection bias is an issue endemic to higher education research (Goldrick-Rab, 2010). College outcomes can only be observed in students who participate, and participation is largely voluntary in most aspects of higher education. Participants will vary in important ways from non-participants. Future research should adopt methodology to account for selection bias by using statistical methods such as propensity score matching.

The use of logistic regression was an excellent research tool to determine which variables are associated with increased rates of completion and can be applied in other settings to good effect, provided that the right variables are included and selection bias is addressed. While it is not possible to include all of the variables that could contribute to increased odds of completion, a wider range of variables than what was explored in this study would be elucidating when investigating student completion. Future research should include one or more variables from each of the factors identified by Burrus et al. (2013). These factors include; institutional environment factors, student demographic characteristics, commitment, academic preparation and success factors, psychosocial and study-skill factors, integration and fit, student finances, and environmental-pull factors.

The results indicated that for this group of CTE students, completion was associated with participation in a complex multifaceted student retention program. However, this study was unable to explain why the program increased completion. The CFS program provided proactive advising, a student-success course, and scholarship funding. Which of these interventions proved

to be the largest contributor in making a difference in completion? Could it be that it was a combination of these interventions that proved to be effective? This study needed a qualitative component to help us understand possible answers these questions. Further research should use qualitative measures to explore the efficacy of each of these individual interventions with CTE students and to explore how these interventions interact to provide a stronger retention program. One specific area of interest would be how scholarship money factors into the student experience. The scholarship award was relatively modest, only \$500. Qualitative measures could be used to determine if this award was large enough on its own to affect the student's ability to persist or if it was seen as merely a way to defer opportunity costs to incentivize participation in the success course and advising.

Results of the logistic regression indicated that with every year increase in age, a student was 1.04 times as likely to complete. There have been mixed results in previous studies on student age (Miller, 2014; Porchea et al., 2010). However, the results of this study indicate that increased age was associated with a higher likelihood of completion. It is possible that this relationship between increased age and likelihood to complete was not entirely linear but followed a curve, with the likelihood of completing increasing at first until reaching the top of the curve; at which point the likelihood of completion would begin to decline with an increase in age. Future research should investigate this potential relationship with age and completion.

It is also possible that the concepts of career and social integration could explain why older students were more likely to complete than younger students. Hirschy et al. (2011) introduced the concept of career integration, postulating that students who were pursuing vocational programs were often more highly directed in their educational intentions. CTE

programs typically have a more direct connection to the job market than an academic program. Stuart et al. (2014) further asserted that students, at least in part, based their educational goals on the job market. Students scan the job market with the goal of finding a career field that will increase their earnings. Post-traditional aged students have experienced the job market and are likely to approach school as a way to increase earnings. This may not be true of their younger counterparts, who may not have experienced the job market and have not yet reached that level of career integration. This was consistent with studies about career alignment, which show that increases in age were associated with increased college and career alignment (D'Amico et al., 2019). Future research should explore the relationship between age, career alignment, and completion. It could be that career alignment better explained completion than age.

A similar concept, social integration, may have played a role in the success of post-traditional aged students. Deil-Amen (2011) describes the socio-academic moment among community college students as the ability to develop social networks and build social capital to solve problems. This is a different concept than the social integration described by Tinto's integration theory (1987, 1993), in which students need to feel as if they belong to the campus community. The socio-academic moment is more practical in nature. It may be that post-traditional aged students are more adept at social networking and developing social capital. It is likely a skill they would have had to develop in their everyday lives to accomplish a multitude of tasks, whereas traditional-aged students have not yet had to master this skill in their everyday lives. The effect of social networks and social capital in the retention and completion of CTE students, and post-traditional aged students specifically, could be another area for future research.

This study was not able to examine the effect that career integration and the development of career and social integration had on CTE students' degree completion. Future research should examine the role that career and social integration, and the development of career and social capital, has on post-traditional aged CTE students and their ability to persist to completion. It could be that post-traditional aged students pursuing CTE programs have higher levels of career and social integration, and have higher levels of career and social capital, than students who are younger or are pursuing more academic programs. Future research could examine this possibility.

There are existing student service programs that are designed to increase social and career integration, for example TRIO Student Support Service (Quinn et al. 2019). Many of these programs, including TRIO Student Support Services, focus on students pursuing academic programs. Future research could determine the efficacy of these programs when applied to CTE students. If these programs are effective in increasing career and social integration, it could lead to a subsequent increase in retention and completion. Future research could determine if this is the case.

In this study, Pell eligibility was found to be a variable that increased the likelihood of completion. Financial-aid programs have been found to promote higher rates of persistence in college students, so it is not surprising that Pell-eligible students would have a higher likelihood of completing (Goldrick-Rab, 2010). It is clear that a student's ability to pay has a part to play in whether or not they will persist in college. However, this study did not explore this connection in-depth. At the time of the study, the host institution had the lowest tuition rate in the state of Idaho. The low tuition rate, combined with Pell eligibility, could have resulted in higher levels of

students with unmet need (i.e. the total cost of attending college minus the level of financial support coming from financial aid and scholarships). Further research could more closely examine the question surrounding a student's ability to pay for CTE programs and its effect on retention and completion.

Pell eligibility can also be seen as a proxy of socioeconomic status. When interpreted in this way, the results of the study are somewhat surprising, given that lower economic status is typically associated with lower levels of retention and completion (Goldrick-Rab, 2010). Future research could examine the relationship between socioeconomic status and CTE program completion. Do students from lower socioeconomic backgrounds complete CTE programs at greater rates than academic programs? If so, why? Perhaps students from lower socioeconomic backgrounds bring with them a sort of blue-collar cultural ethos that lends itself to the completion of CTE programs. These are the sort of questions that future research could explore.

This study was not able to examine race and ethnicity as a variable in relation to completion. This could also be a fruitful avenue for future research. The achievement gap experienced by underrepresented minority groups has been gaining increased attention: in college, Black and Latino students experience lower graduation rates and often take longer to complete a degree than their White or Asian counterparts (Martin et al., 2017). This issue is seen as contributing to inequality, as reducing these gaps would lead to declines in racial and ethnic disparities in educational attainment, earnings, and high-status professions. Research should be conducted to determine if retention programs like CFS could be a useful tool in closing the achievement gaps within these groups.

This study looked at self-identified biological sex as a student background variable that could potentially affect student retention. Further research needs to be done not only on biological sex, but also on the broader area of sex, sexual orientation, and gender identity. Further research should investigate which retention interventions are effective with students who identify as LGBTQ. However, institutions should not focus solely on retention programs for the LGBTQ community. A focus on programs could be indicative of a limited willingness to engage in systemic change (Denton, 2020). Instead of digging in and competing the difficult work of building equity into the educational system, these programs are added onto the existing structure. This can send the signal that equity and inclusion are the purview of a single department on campus and not the responsibility of the campus community as a whole. It would also be appropriate to examine the power relations on campuses that reinforce and promote heteronormative conceptions of sex and gender (Denton, 2020). For example, the conflation of sex and gender that emerged during this study is one example of this power dynamic. Students were asked to list their gender on their admission application, when the institution was actually interested in obtaining information on biological sex. This limited institutional conception of gender on the application is one of the first experiences a student has with the institution, and this reinforces the heteronormative power dynamic of gender as a binary. It is easy to imagine how an experience like this could affect a student's persistence at the institution. A qualitative research study would be beneficial in understanding the experience of LGBTQ students as they encounter these heteronormative structures in institutions of higher education and how it affects their ability to persist.

Implications for Policy and Practice

The results of this study indicated that participation in a complex, multifaceted retention program was associated with a higher likelihood of completion for CTE students pursuing certificate and associate degree programs. Often these types of retention programs have been directed at students pursuing academic programs and not to CTE students. It has been noted that CTE students make strong bonds with their program faculty members, and consequently they do not need more support (Van Noy et al., 2016). However, the results of this study suggested that CTE students could benefit from a broader base of support including student services and support from other students outside of their program of study. More institutions should consider offering retention programs not only to academic program students, but to their CTE students as well.

The literature review started with a broad focus on student retention theories. It then narrowed to professional judgement, and then narrowed even further to specific interventions. The implications for practice outlined below will follow a similar structure.

Student Retention Theory

The labor market conception of student retention (Stuart et al., 2014) provided a useful framework theory when thinking about the retention for community college and CTE students. In this model, a college degree was seen as a way to improve an individual's earning potential in the job market. A student invests time and money now to complete a degree that will allow them to earn more money later in their careers. With this model, acknowledging that a student is almost always weighing the cost and benefits of attending college, provides a way to improve student retention; ensure that the student has an excellent return on investment. If the cost of continued

attendance becomes greater than the perceived benefit of completing their degree, then students will not persist.

Students are not only investing money into the pursuit of a degree. The investments students make comes in three categories: pecuniary, psychological and opportunity (Stuart et al., 2014). Pecuniary refers to the financial cost of attending school. This is the money students spend on tuition, books, and supplies to attend college. Psychological costs refer to the intangible costs a student can experience while attending college. It can refer to the emotional toll that comes from being poorly prepared for math, or the stress of attempting to meet deadlines on assignments for multiple classes. Finally, there are opportunity costs to attending college. This may come in pecuniary form. While attending college, a student may lose the earning potential of a full-time job. Opportunity costs, while typically thought of in pecuniary terms, can also come in the form of psychological costs (Stuart et al., 2014). When a student chooses to spend time in the classroom or on homework they forgo the psychological benefit that they would derive from the opportunity to spend time with their family or friends. With this in mind, it is important to design strategies that improve a student's cost-benefit analysis. This could be done by decreasing the cost and increasing the perceived benefit to the student.

Policy should be made to decrease the pecuniary costs of attendance. Colleges should provide financial support packages that include grants, scholarships, and work-study money. Colleges should make efforts to contain the increasing costs of attending college and keep tuition as low as possible. Alternative funding methods could also be explored. Income Share Agreements (ISA) offer an alternative to federal loans (Delaney et al., 2019). Colleges offering ISAs extend financing to a student and allow them to repay based on their income level upon

graduation. The benefit to this type of funding programs is the ease with which students can access them; no cosigner or credit history is required. Additionally, repayment is entirely contingent on income after graduation. If students have a low income or are unemployed upon graduation, then they do not repay the funding. On the other hand, a student who earns a high income upon graduation would pay more than they would with a conventional loan. This excess would go to cover the cost of funding those students who are unable to pay back their portion.

Policies could be made to mitigate other costs of attending college. To combat the increasing cost of textbooks, colleges should expand their use of open educational resources to use as course textbooks. Colleges could also help students with living expenses while attending colleges. Many colleges, of all kinds, have created student pantries that provide students experiencing food insecurity with food items at no charge (Cady & White, 2018). Transportation can also be a huge expenditure for students. Colleges could partner with community transportation districts to provide students with passes to mass transit at no or low cost. Colleges could also strategically schedule courses so that students could minimize the number of days they will need to travel to campus. Childcare can be an issue for students with dependents. Colleges could offer childcare services for their students. Where this is not feasible, colleges could potentially negotiate reduced rates for their students at local childcare providers. All of these are issues that are known to impact retention. In an environment of fiscal instability colleges need to find new ways to provide solutions for these issues. Exploring partnerships with community organizations or public private partnerships may help in alleviating the difficulties that students encounter.

In addition to mitigating cost, colleges could also increase the perceived benefit a student receives by completing a college degree. This could be done by helping the students build career capital. Programs should be designed to facilitate career exploration and quickly help students identify potential career fields. Degree programs should have a very clear career connection and opportunities for on-the-job experience. These degree programs should have the potential for job placement within the local community. Job and labor market information, such as job openings and starting wages, would also help students clearly see the benefits of their chosen degree program.

Additionally, colleges could help students address the psychological and opportunity costs of attending college by encouraging the development of social capital. Students will need to develop and use social networks to be successful in achieving their educational goals. This includes the formal network of college support resources, such as advising and tutoring. It also includes an informal network of other college students who can help each other solve problems. Colleges should be strategic in supporting the growth of these networks. Students could be introduced to formal resources through a systematic intake and orientation process. This process should be required for every student entering the college. Introducing students to informal networks could be done through a variety of different avenues. Student clubs and extended orientation classes are two examples that have been employed to facilitate student interaction and the development of social networks.

Professional Judgment

Now that theories of retention have been discussed, the discussion will move to professional judgment. Professional judgment is needed to translate theory into practice. Several

writers have offered their professional judgment on how to increase retention (Braxton et. al, 2014; Karp, 2016; Tinto, 2012), and some of these writings have clear implications for practice.

Research findings have indicated that students showed increased commitment to the college they were attending when they perceived that the institution was dedicated to the students' wellbeing, and the institution had demonstrated integrity (Braxton et al, 2014). Increased commitment to the institution led to increased retention. Indirectly, increasing the students' perception that the institution had integrity and was dedicated to the wellbeing of students led to increased retention. The implication is that institutions of higher education should strive to increase the perception that they are dedicated to the wellbeing of their students. The best way to increase the perception that the institution is dedicated to the wellbeing of students is to *actually* be dedicated to the wellbeing of students. This means not only paying attention to student outcomes such as retention, completion, and job placement; but also recognizing their value as human beings and treating them as such rather than numbers on a balance sheet. This dedication to the wellbeing of students should be the central value of the institution. Colleges should intentionally build a culture of being student centered.

Students should be given clear and consistent expectations by the institution about what it will take for them to be successful in college (Tinto, 2012). They should be given clear expectations inside each classroom and they should be given clear expectations on what it will take for them to complete their degree. In addition to these expectations, students should have support as they strive to meet these expectations. All too often, institutions have high expectations of their students, but do not clearly articulate these expectations nor do they offer support to help their students meet these expectations. As the students who attend college have

become increasingly diverse, the sort of supports that are needed have grown as well. Institutions need to offer supports that fit the needs of their students.

These supports should be available and inclusive of all students, including those that are pursuing CTE degrees. Many of the studies of CTE programs noted the tenuous connection students had with their academic advisors and student services in general, to the extent in some cases that CTE students were not even aware that student services existed (Daulton, 2015; Nadel et al., 2017; Van Noy et al., 2016). Instead, these students forged strong relationships with their instructors. Student success courses and intrusive advising are frequently offered to students in academic programs. However, these support programs are less frequently offered to students pursuing CTE programs. It would be beneficial to offer this sort of academic advising, and overall student service support, to CTE students. A student's relationship with an advisor should not supplant the strong relationship that has been created with instructors. Rather, it should be another line of support that a student receives as they complete their program of study. This is particularly important in situations when a student is unable to form a strong relationship with their CTE instructor and needs an alternate supportive relationship to aid them toward completion.

Four common student services mechanisms have been identified as encouraging retention and completion: creating social relationships, clarifying aspirations and enhancing commitment, developing college know-how, and making college life feasible (Karp, 2016). Any action that a student service provider undertakes should be done in the pursuit of one of these four mechanisms.

Additionally, efforts to increase student persistence should focus on instilling these four mechanisms into student services processes. Often, when an institution wishes to increase retention, they create a new program or initiative and completely ignore their existing student services (Karp, 2016). Rather than creating an entirely new program, institutions should turn their efforts to ensuring that current student services processes are infused with the four mechanisms. One way to do this would be to build the four mechanisms into student services program assessments. If the four mechanisms are used as the program-level objectives for a student services function, then it would instill these concepts into the day-to-day work of that program.

Student service processes should also be intrusive so that students are forced to encounter them (Karp, 2016). Advising should be made mandatory, as should participation in a student success course. This would mean that students would be required to meet with an advisor before they are cleared to register, and a student success course would be part of the required curriculum of study for any student attending the institution. Early-alert systems are another way that advising could be made intrusive. Letting advisors know when a student is struggling so help can be brought to them rather than waiting for the student to initiate contact which often comes too late.

Retention Interventions

Moving now from professional judgement into specific interventions, each individual institution will need to determine which specific intervention, or suite of interventions, they will use to address the issue of student retention. Institutions will need to take stock of the challenges their students face as well as the institutional and community resources that can be utilized to

address these challenges. In essence, this describes the process by which an overall retention plan is formed (Mertes & Jankoviak, 2016). First, a retention committee would be formed to include various stakeholders on campus. Then, the committee would survey students to determine the challenges that their student body is facing. Using this information, the committee would then develop a retention plan that would bring resources to address the identified issues and coordinate the retention efforts across campus. Using this process, every college can and should develop a strategic retention plan.

A similar approach should be given for the strategic management of academic advising. Institutional approaches to academic advising tend to be fragmented (Joslin, 2018). This has led to a chaotic situation where different advising systems and strategies exist in different units on the same campus. On the same campus, one academic unit may have a well-developed advising process that employs a professional advisor and sophisticated advising software, while another academic unit may see advising done by overworked professors when it is not part of their workload. Strategic academic advising management would trade this chaotic approach for a campus-wide management of academic advising, in line with the guided pathways approach (Bailey et al., 2015). This approach came from an academic administrator's perspective of seeing simple single-concept initiatives fail in isolation and advocates for a more complex, systematic, and holistic approach to student success (Joslin, 2018).

This approach not only works for academic advising, but for student services in general. A recent study concluded that complex multifaceted programs are more effective than simple interventions (Monaghan et al., 2018). Instead of individual student services offerings, there was a benefit to coordinating multiple efforts into an overall retention program. Academic advising,

financial aid, tutoring and other support services can coordinate and work together. This could bring about a sort of synergy (Monaghan et al., 2018). Additionally, retention efforts should be continuous. These efforts should follow students as they progress through college, from application to graduation. This contrasts the current approach to retention interventions, which generally end after the first year, or exist at other single points in the college career.

Advisors should utilize a proactive advising approach. While this approach can be effective with students in any type of program, it would seem to be imperative with CTE students, considering the evidence of the tenuous connection that CTE students have with their advisors. This means not waiting for students to contact them, but for advisors to reach out to the students at important times throughout the academic calendar. Check-ins during the first few weeks of classes, at midterms, and finals are crucial; these are some of the most challenging times for students. At the beginning of the term, students are settling into their courses and may not be aware of the resources that they have available to them. During midterms and finals, they are preparing for several large stressful tests. Additionally, some colleges have implemented early-alert systems to let advisors know when a student is not doing well in a class. At this point the advisor can then initiate contact with the student and help them find solutions.

Summary

The current levels of completion rates at colleges and universities are unacceptable. Not only does a college degree increase the earning potential of the individual, but a college-educated workforce is critical for our nation's ability to stay competitive in the global marketplace (Carnevale et al. 2020; Tinto, 2012). Access to education is not enough, starting a college education without finishing yields little benefit to the individual or society.

Access without support that provides a clear path to graduation is not opportunity (Tinto 2012). Colleges and universities have an obligation to provide support to their students so that opportunity is truly on offer. Multifaceted retention programs are an example of the type of support that is required to provide opportunity for our students. Multifaceted retention programs have shown to be effective in improving retention and completion rates (Miller et al., 2020; Scrivener et al., 2015; Sommo et al., 2018; Weiss et al., 2019). The results of this study indicate that the CFS program was associated with higher rates of completion for CTE students. Colleges and universities can and must do more to support students to graduation. Multifaceted retention programs are one approach that can be taken.

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Appendix A: Correlation Matrix of Independent Variables

Correlation Matrix

Variable	1	2	3	4	5	6
1. CFS						
2. Non. Trad Age	-.016					
3. sex	-.030	.070**				
4. FGS	.035	.019	.076**			
5. Deps.	-.020	.425**	.240**	.090**		
6. Pell Eligibility	.099**	.187**	-.016	.071**	.227**	

Note: ** indicates correlation is significant at the 0.01 level

Appendix B: Stepwise Regression Table

Step 1

Variable	B	SE	Wald	df	Sig	Exp(B)
CFS	.356	.149	5.728	1	.017	1.428
Constant	-.174	.054	10.559	1	.001	.840

Step 2

Variable	B	SE	Wald	df	Sig	Exp(B)
CFS	.279	.106	3.426	1	.064	1.322
Pell Eligibility	.586	.106	30.365	1	.000	1.796
Constant	-.541	.087	39.068	1	.000	.582

Step 3

Variable	B	SE	Wald	df	Sig	Exp(B)
CFS	.309	.153	4.067	1	.044	1.362
Pell Eligibility	.538	.108	24.748	1	.000	1.713
Age	.042	.006	49.181	1	.000	1.042
Constant	-1.825	.204	79.748	1	.000	.161

Step 4

Variable	B	SE	Wald	df	Sig	Exp(B)
CFS	.311	.153	4.117	1	.042	1.365
Pell Eligibility	.541	.108	24.926	1	.000	1.718
Age	.042	.006	49.354	1	.000	1.043
FGS	-.046	.103	.200	1	.655	.955
Constant	-1.807	.208	75.246	1	.000	.164

Step 5

Variable	B	SE	Wald	df	Sig	Exp(B)
CFS	.306	.153	3.989	1	.046	1.358
Pell Eligibility	.538	.109	24.583	1	.000	1.713
Age	.043	.006	50.400	1	.000	1.044
FGS	-.038	.103	.132	1	.716	.963
Sex	-.117	.108	1.192	1	.275	.889
Constant	-1.767	.211	69.877	1	.000	.171

Step 6

Variable	B	SE	Wald	df	Sig	Exp(B)
CFS	.314	.154	4.174	1	.041	1.369
Pell Eligibility	.509	.111	21.020	1	.000	1.664
Age	.040	.006	38.842	1	.000	1.041
FGS	-.045	.103	.188	1	.664	.956
Sex	-.146	.110	1.750	1	.186	.864
Dependents	.143	.116	1.510	1	.219	1.154
Constant	-1.708	.216	62.454	1	.000	.181

Appendix C: Institutional Research Board Approval

February 27, 2018

Jared Gardner
Education
1600 S 25 East
Idaho Falls, ID 83404

RE: Regarding study number IRB-FY2018-239: The Effectiveness of a Targeted Retention Program at a Technical College

Dear Mr. Gardner:

This message is your official notification that your project/survey IRB-FY2018-239: The Effectiveness of a Targeted Retention Program at a Technical College does not meet the definition of research under the Code of Federal Regulations Title 45 Part 46.102(d); therefore is not subject to review by the Institutional Review Board. You are free to conduct your study as submitted.

Sincerely,

Ralph Baergen, PhD, MPH, CIP
Human Subjects Chair



Appendix D: Research Institution Authorization



1600 South 25th East • Idaho Falls, Idaho 83404-5788 • 208.524.3000 • www.cei.edu

February 15, 2018

This letter provides authorization for Jared Gardner to utilize data from the College of Eastern Idaho's Colleague database relative to his dissertation titled "The Effectiveness of a Targeted Retention Program at a Technical College". At the College of Eastern Idaho, in the absence of an Institutional Review Board, authority for utilization of data for outside research rest with the President of the College.

The data is archival, and poses no risk to human subjects.

Data will be compiled by the College of Eastern Idaho's Department of Institutional Research, and will be provided on an Excel spreadsheet after all personal information has been removed.

Data reported in the dissertation will be aggregate.

Sincerely,

A handwritten signature in black ink, appearing to read "Rick Aman", with a long horizontal line extending to the right.

Rick Aman, PhD

President

